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MEDICAL ASPECTS OF THYROID DISEASE.

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THERE has been a tremendous amount of work carried out on both the physiological and experimental aspects of thyroid function in the past ten years. This work has been made possible by new techniques using radioactive iodine, zone electrophoresis and filter-paper chromatography. As a result of these new ideas, there has been a much better understanding of the problems of thyroid disease and a greater ability to treat these conditions.

Thyroid Hormones.

Despite all the work on the less iodinated thyronines and the demonstration of their metabolic activity, it is generally agreed that the principal hormone secreted by the thyroid gland into the blood-stream is still thyroxin. The thyroid gland traps and oxidizes iodine in the blood, which is then incorporated into two amino-acid derivatives of thyroglobulin (tyrosine and histidine). Thyroxine is formed by the conjugation of two molecules of diiodotyrosine. Triiodothyronine is formed by the conjugation of monoiodotyrosine and diiodotyrosine. Thyroglobulin serves only as a store of hormones which diffuse out when freed by enzymatic activity. There are at least four iodinated thyronines present in the normal thyroid gland—thyroxin, two forms of triiodothyronine and diiodothryonine. It is mainly as thyroxin that the hormone is found in the blood-stream, but there are also small amounts of triiodothyronine. The thyroid hormone is metabolized in the following three ways: (i) removal of the iodine; (ii) conjugation with glycuronic acid in the liver; (iii) deamination. The main metabolic pathway for thyroxine appears to be deiodination to triiodothyronine. This releases a much more active compound. There is very good experimental evidence for this concept (Michel, 1956). This process has been shown to occur in rat kidney slices, and to be inhibited by thiouracil, iodine and triiodothyronine. There appears to be a direct relationship between the capacity of kidney slices to remove iodine from the thyroxine and the level of thyroid activity. Further experiments with kidney homogenates have shown active metabolism of both thyroxine and triiodothyronine—the breakdown here was not deiodination but the formation of tetraiodothyracetic acid from thyroxine and triiodothyracetic acid from triiodothyronine (Albright *et alii*, 1956). Both these acetic acid derivatives have been shown to possess thyroxine-like activity. It has been suggested that the acetic acid analogues are the form in which thyroid hormone acts on the tissues. To complete the picture, we have a new understanding of the carriage of the thyroid hormone in the circulation. It appears that the majority is carried between the alpha-1 and alpha-2 globulins. This is almost specific for thyroxine, which is bound more firmly to the globulin than triiodothyronine (the latter is displaced by thyroxine from the binding site). This may account for the greater speed of the biological action of triiodothyronine. Only about one-third of the capacity of thyroxine-binding-protein (T.B.P.) is utilized in normal subjects, but half or more is taken up in thyrotoxicosis (Dowling, Freinkel and Ingbar, 1956).

[1] Read at a plenary session on thyroid disease, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

An increase in thyroxine binding to protein has been shown to occur in pregnancy, which explains the well-recognized triad of thyroid enlargement, increased avidity for iodine and a raised serum level of protein-bound iodine in pregnancy. This has been reproduced by giving diethylstilbœstrol to patients. Patients with threatened abortion failed to show the increase in thyroxine-binding capacity of T.B.P. as seen in normal pregnant women. A lowering of the T.B.P. level has been shown in the nephrotic syndrome, with an increase in T.B.P. during steroid therapy or with regression of the disease.

Finally, recent work suggests there may be a more easily broken thyroxine-protein linkage in diffuse toxic goitre, and also that there may be a more rapid breakdown of thyroxine, the thyroid thus being stimulated to greater activity and so further hyperplasia; that is, the defect is not in the gland, but in the peripheral circulation and metabolism of the thyroid hormones. Patients with nodular toxic goitres showed similar results to euthyroid patients.

Antithyroid Drugs.

There is still a great deal of argument as to the usefulness of antithyroid drugs in the treatment of toxic goitre. Astwood has always been a great protagonist of their use, and certainly produces some telling results to back his arguments. My own opinion has undergone several changes, but I now use these drugs more than I did five years ago. This fact has been influenced both by increased experience in their value and by the introduction of newer and less toxic compounds. It does appear that "Neo-mercazole" (carbimazole) produces fewer toxic reactions than did the thiourylene compounds, though many toxic reactions with all these drugs have been due to mistakes in dosage and administration. Carbimazole also appears to cause less vascularity of the gland, and with proper dosage, rarely causes any increase in the size of the goitre. If one believes that the antithyroid drug therapy should be stopped seven to ten days before operation (which I do not), then there is a risk of "escape" of the patient with carbimazole.

There is no doubt that for children and adolescents, treatment with antithyroid drugs is the treatment of choice, as it avoids myxœdema and also the theoretical risk of carcinoma developing after radio-iodine therapy.

In "border-line" cases of thyrotoxicosis, it enables good control to be obtained. Later, it may be decided to use ^{131}I. Employed as a diagnostic test, the antithyroid drugs have been most useful; the subjective response is usually quite dramatic and outstrips the objective response. This therapeutic trial has the advantage of not blocking the thyroid uptake should ^{131}I be decided upon, as is the case with iodide therapy. In conjunction with ^{131}I, these drugs have been most valuable; they may be used to bring the disease under control while the patient is awaiting the dose of ^{131}I. This avoids any risk of crisis, particularly in hot weather. It has been our practice at the Royal Melbourne Hospital over the past five years to use carbimazole in a dosage of 20 milligrammes daily for the first month after radio-iodine therapy, starting 48 hours after giving the dose. This has produced a smoother recovery.

In severe exophthalmos, the use of these drugs minimizes any risk of permanent injury to the eyes, since a delicate control of the thyroid state is possible and hypothyroidism can be avoided. On the whole, radio-iodine therapy has been disappointing with this nasty complication.

Hashimoto's Disease.

Alterations in the serum proteins have been found in patients with Hashimoto's disease. These are positive results to flocculation tests and an increase in the gamma globulin levels. The highest value occurred in patients with large goitres who had not received any treatment. After removal of the goitre, these values gradually fall to normal levels. They also fall to normal after thyroid or steroid therapy. Doniach and Roitt (1957) have demonstrated in the serum of these patients auto-antibodies against thyroglobulin. These were also found in spontaneous myxœdema and in subacute giant cell thyroiditis. The precipitin reaction disappeared with medical or surgical treatment. The antibody is organ-specific. It is suggested that inactivation of the thyroglobulin by reaction with the auto-antibody depletes the circulatory level of the thyroid hormones, so increasing thyroid-stimulating hormone (T.S.H.) response. This leads to hyperplasia of the thyroid and increased antibody response. Thyroid extract acts by inhibiting T.S.H. and so reversing this chain of events. Cortisone appears to act by its inhibition of antibody production. This gives us a rational basis for our therapy.

Diagnosis of Thyrotoxicosis.

The use of radio-iodine has now an established place in the diagnosis of thyrotoxicosis. However, there is no agreement as to which radio-iodine test is the most useful for this purpose. A glance at the enormous literature on this subject will show the wide variation in the type of test used. In my experience, there have been three governing factors (the reliability of the tests involved being accepted). The first is the ease of collection of the specimens, which automatically excludes tests dependent on urinary excretion in out-patients. Secondly, the test should cause the least possible disturbance to the patient, particularly in the time spent on the test. Thirdly, the demand on the time of the technical staff is important. For the two-hour uptake test and the two-hour neck-thigh ratio, the patient has to make only one visit to the hospital. This visit is somewhat prolonged, but the result is obtained within minutes of the completion of the test. For the 48-hour protein-bound radioactive iodine estimation, the patient has to attend the hospital for two short visits, but the blood sample has to be processed and assayed, so that there is delay in obtaining the result. Nearly all the radio-iodine tests described in the past ten years will distinguish between the frankly thyrotoxic patient and the normal one. The real usefulness of these tests must rest in the help to be given in the difficult and equivocal cases. If only this type of case is investigated, then the results obtained will never appear as impressive as when a series is "loaded" with obvious thyrotoxics. I believe that these three tests satisfy all these criteria and have been a distinct help in reaching an early diagnosis. Admittedly, if the patient is observed over a period, the diagnosis will usually become obvious; but by the use of radio-iodine tests, therapy can be instituted sooner and the patient will be free from her symptoms earlier. The average accuracy of these three tests used together varied between 85% and 90%. There is no doubt that greater accuracy of diagnosis can be achieved by estimating the serum protein-bound iodine content as well, but this requires a highly trained biochemist using a complicated technique. Much greater precautions have to be taken to ensure the accuracy of this estimation, which unfortunately makes the test a very expensive procedure.

Myxœdema.

Myxœdema is the commonest form of thyroid disease seen by the physician. It is impossible to assess accurately its rate of occurrence in the community, since figures vary according to both the incidence of goitre and the interest taken in the investigation of the thyroid gland. Since the use of radio-iodine therapy has become widespread, two types of decreased thyroid function are seen. The first is a transitory state occurring about three to six months after therapy, which we have called hypothyroidism. The patient complains of feeling the cold and of gain in weight, while the diastolic blood pressure has always been found to be elevated in these patients. They do not show the florid features of myxœdema and respond well to replacement therapy with moderate doses of thyroid gland extract. The importance of the separation of this group is that the symptoms are temporary and, after six months' therapy, the thyroid apparently recovers. It is probably due to temporary excess destruction of the secreting tissues, or to too prolonged use of antithyroid drugs after radioactive iodine therapy. Unfortunately, typical permanent myxœdema may be seen after radio-iodine therapy—our figure in the radioactive iodine clinic at the Royal Melbourne Hospital is around 5% (most figures vary between 5% and 10%). The recent discovery of triiodothyronine and the acetic acid derivatives has stimulated investigation of their use in myxœdema. All these substances have

been found to be effective in relieving symptoms, but it is generally agreed that they are not suitable for general use. Triiodothyronine is two to five times more potent than thyroxine. Its action is rapid and may therefore precipitate cardiac complications in the elderly. There is a very definite withdrawal syndrome, seen within 24 hours of ceasing therapy. There is a rapid return of the symptoms and signs of myxœdema, which may be even more severe than before treatment. This, of course, is explained by the rapid dissociation of triiodothyronine from the globulin in the serum to the intracellular department. Its main use is in myxœdema coma, in which it may be life-saving. Rawson has noted the usefulness of this hormone in acute alcoholism and also in treating severe chronic radiation changes in the skin.

Both "Triac" and "Tetrac" have been shown to lower the serum cholesterol levels, but their use in atheroma has not been successful. Recently, by the substitution of halogens, tribromthyronine has been found to have thyroid hormone-like activity. It is less active than thyroxine, but may be useful if iodine has to be avoided. Suggestions have been made that some states of hypometabolism are due to failure of deiodination of thyroxine to triiodothyronine. This state would not respond to thyroxine, but triiodothyronine could be expected to relieve the symptoms. Such cases have been fully investigated and described. The dangers of indiscriminate triiodothyronine therapy are very real, and care should be taken that it is not used widely for its non-specific subjective tonic effect without careful control.

In summary, the standard treatment for myxœdema is the administration of thyroid extract. Occasionally, thyroxine may be necessary to achieve a full therapeutic effect. Triiodothyronine is a new and potent weapon for the severe, rare and dangerous complications of myxœdema.

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THYROID DISEASE: PUBLIC HEALTH ASPECTS.

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THIS presentation will be limited to three aspects of the problem of thyroid disease: (*a*) ætiology of endemic goitre; (*b*) treatment of endemic goitre; (*c*) sequelæ of endemic goitre.

Ætiology of Endemic Goitre.

There is a considerable body of evidence to confirm that much of the endemic goitre is due to a deficiency of iodine in the diet, which in turn is due to a deficiency of iodine in soil in which foods are grown and on which stock is grazed for both meat and milk production. Although the iodine content of surface waters is often used as an indication of the amounts of iodine available, it is a poor guide and of limited value. A prevailing misconception is that endemic goitre should not occur in those living near the sea. This idea seems to stem from the belief that sea foods as a class are rich in iodine—that atmosphere soil near the sea has more iodine than inland areas. Recent work casts serious doubts on all these beliefs. Only a limited number of varieties of sea fish contain significant amounts of iodine, and these feed on particular varieties of seaweed.

[1] Read at a plenary session on thyroid disease, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

The provision of increased amounts of iodine in the diet by one of the various methods has reduced the incidence of large endemic goitres in many localities; but small goitres still occur in significant numbers in some of these places. For example, iodized salt was introduced in New Zealand about 30 years ago. A survey made in 1951 (i.e., 25 years later) showed that large goitres do not occur, but that about 60% of school children had "small incipient goitres". Similar observations have been made in the Lakes District of the U.S.A. Our experience in Canberra seems to have been more definite. The introduction of small amounts of potassium iodide to the diet of children, and more recently to the whole population there, has largely resulted in the failure of new cases to appear.

A number of workers in this field have not been entirely satisfied with the iodine theory. McCarrison (1928) for many years steadfastly strove to prove the presence of an infective agent. Greenwald has published many articles claiming that an infective agent is the ætiological factor (Greenwald, 1950).

Our Tasmanian experience has led us to advance the hypothesis that a significant amount of the endemic goitre in this State is due to the action of a goitrogen which is present in the milk of some cows (Clements, 1956). Our present thoughts are that certain plants of a cruciferous family contain sulphur-bearing compounds which are converted in the rumen of the cow into goitrogens.

When the work was commenced in 1954 to trace the source of these goitrogenic substances, we believed that one plant, chou moellier, was largely responsible for this substance. Since then further work has led us to believe that weeds such as lesser swine cress, shepherd's purse, pepper cress and the erodiums might also be factors.

Investigations we have made in southern Queensland have led us to suspect the "wild turnip" (*Rapistrum rugosa*), which grows profusely around Warwick, may also contain a goitrogenic precursor and be the explanation of the goitre that occurs in that region. The distribution of the goitre in the Warwick area is interesting. Endemic goitre occurs only in the children living in the valleys where the *Rapistrum rugosa* grows prolifically, and not in the children who live along the gravel ridges where the weed does not grow. There is an interesting commercial aspect of this weed problem. It is responsible for the taints in milk and butter produced in that district, and the level of tainting is so high in the late spring and summer that much of the milk cannot be used for liquid milk consumption or for the manufacture of first-grade butter.

We have some slender evidence which suggests that goitrogenic substances in milk have been responsible for some of the endemic goitre in Tasmania for perhaps half a century; but it is clear that this ætiological factor has become far more important in recent years, owing we suggest, to an increase in the consumption of milk, which is now at least twice what it was before the Federal Government's free milk scheme for school children was introduced in 1950. Another factor is the change in dairy farm management since 1950. The acreage under chou moellier has been greatly increased, to provide a fodder crop in the winter and early spring for milk cows.

Although it has been possible to demonstrate on experimental animals (rats), by means of ^{131}I techniques, high goitrogenic activity in extracts from milk from cows fed on these weeds, we have not yet succeeded in obtaining the goitrogenic substance in a form that will allow of chemical analysis. Our present thinking is that there are probably several substances.

This hypothesis has been developed on the basis of work done in Tasmania and Queensland, with some useful data from New South Wales. However, there is some evidence to suggest that it is applicable to some of the endemic goitre in New Zealand and in parts of North America. It is also possible to build up a slender chain of evidence that it could have been a factor in endemic goitre in England.

This hypothesis even in its present form—that is, without having been proven—has certain implications for practitioners and public health officers. A sharp epidemic of endemic goitre apparently occurred in children living in the channel port towns of southern Tasmania in 1956. We have reliable figures for the incidence of goitre from 1954 onwards, and it seems that the incidence jumped from approximately 4% in boys and 13% in girls in 1954 to between 30% and 40% in both sexes in 1956, despite the fact that children had been receiving one tablet containing 10 milligrammes of potassium iodide weekly from 1954 onward. Even the administration of one tablet twice a week through 1957 had failed to prevent a further significant increase during that year. There is some evidence that the unusual autumn in 1956 had resulted in a marked overgrowth of cruciferous weeds in that part of Tasmania, and that seeding had led to a further increase in 1957.

The other significant factor is that a comparatively large dose of potassium iodide—i.e., 10 milligrammes twice a week—had been without effect upon the epidemic. This suggests that the control of endemic goitre may not be a medical, but rather an agricultural problem.

Treatment of Endemic Goitre.

This naturally leads to the question of the treatment of an enlarged thyroid. My own experience in Canberra is that prophylactic, or even therapeutic, doses of iodine are of extremely limited value. If they are administered to a child with a visibly enlarged thyroid, there is some shrinking and hardening of the gland, but no appreciable reduction in size. I understand that this is the experience of many practitioners in Hobart.

The alternative line of therapy, which strangely enough enjoyed much popularity in France and Germany in the 1880's, and which was revived in the U.S.A. by Greer and Astwood (Greer and Astwood, 1953) some four or five years ago, has been the method of choice of a number of Hobart physicians for many years. I refer to the use of small doses of thyroid.

Although some physicians here have had extensive experience with this method and have thus treated thousands of children, we lack detailed records and evaluations.

I should like to make a plea for the establishment of a clinic where the thyroid metabolism of children with enlarged thyroids can be studied, and where the effects of various types of therapy can be followed.

Sequelæ of Endemic Goitre.

Persistence of a Colloid or Nodular Goitre with Hypothyroidism.

Many earlier text-books stated that by definition endemic goitre was always associated with euthyroidism. This is undoubtedly true for the uncomplicated endemic goitre during the hyperplasic and colloid phases; but once degenerative changes occur, with the subsequent formation of nodules, it is reasonable to argue that the condition is no longer an endemic goitre. The progressive destruction of epithelial elements by the overgrowth of the stroma and the pressure of enlarging colloid spaces gradually reduces the capacity of the thyroid gland to produce thyroxine. Because the processes of hyperplasia and involution are more frequent in females than in males, often being associated with repeated pregnancies, it is not surprising that myxœdema of this origin occurs much more frequently in women than in men; Osler gives the relative proportions as about 6:1. This form of myxœdema, because of its slow onset, is difficult to detect. Since the development of this condition is generally postponed until the fifth and sixth decade, the accompanying reduction of physical and mental activity is often attributed by the patient and her friends to age. Physicans with long experience in goitrous areas are aware of these changes in many of their female patients with long-standing goitres.

Clinically, the signs and symptoms of myxœdema arising in this way are not different from those described in text-books; it is probable that much of the earlier descriptive material was drawn from patients whose myxœdema arose in this way.

Development of Secondary Thyrotoxicosis.

A number of writers have drawn attention to the possibility that endemic goitre predisposes the subject to secondary toxic goitre. The evidence is indirect, and while it is not conclusive it nevertheless strongly supports such an hypothesis. Campbell (1924) compared the distribution maps for thyrotoxicosis and endemic goitre for the British Isles, and concluded that "it follows that in the British Isles exophthalmic goitre is more likely to occur in connection with an area of endemic goitre". McClendon (1939) showed that in North America the geographical distribution of thyrotoxicosis coincided with the areas of high incidence of endemic goitre. The same author collected the number of cases of exophthalmic goitre per 100 cases of endemic goitre for the various zones of Europe. This analysis failed to show a consistent relationship; for example, much higher figures for toxic goitre were obtained for certain parts of northern Italy and Germany than for Switzerland, where the incidence of endemic goitre has always been considered to be very high. More recently Saxen and Saxen (1954) have shown that the incidence of toxic goitre is considerably higher in the rural areas of Finland with moderate and high endemicity of simple goitre, compared with rural areas with low incidence of goitre. The approximate ratio of toxic goitre in the non-goitrous, moderately endemic and severely endemic areas was 1:2:3·5. In Australia, Wyndham (1940) was the first to show that in the State of New South Wales "there seems to be, therefore, a natural tendency for these non-toxic goitres to become hyperplastic and hyperfunctional in middle life". Later Clements (1954), in an Australia-wide study, showed that the death rates for thyrotoxicosis had been highest for those States with the highest incidence of endemic goitre, and lowest in those States where endemic goitre did not occur. Reviewing some of this evidence, Rundle (1951) concluded that "there is powerful evidence from goitre maps that endemic goitre predisposes to thyrotoxicosis". This conclusion seems justified for certain parts of the world, more particularly North America, the British Isles and parts of Europe and Australia; but the evidence in respect of other parts of Europe and many of the so-called economically underdeveloped areas of the world is inconclusive or non-existent. It is surprising that McCarrison (1908, 1914) and Stott and his co-workers (1931, 1934) failed to record toxic goitre in the highly goitrous valleys of the Himalayas and India. In the high plateaux of the Andes, where several surveys have been made, there are only passing references to toxic goitres. Mahorner (1951) was told that toxic symptoms did occur in the Indians of Guatemala who had large goitres, but apparently saw none himself in an extensive visit. In several surveys in Central and South American countries, no reference has been made to the existence of toxic goitre. The one exception in the American continent is in the Mendoza province of Argentina, where Perinetti (1952) found a relatively high incidence of toxicity superimposed on nodular goitre.

The irregular occurrence of thyrotoxicosis as a sequel of endemic goitre throughout the world raises a number of questions: Has the condition been overlooked in the localities where it has not been reported? Do the sequelæ of endemic goitre differ in different localities? Does the nature of the ætiological factors of the endemic goitre determine the predisposition to toxicity?

To come back to Tasmania, the high incidence of thyrotoxicosis underlines the seriousness of endemic goitre and the need to determine the exact ætiological factors and establish ways of preventing the condition.

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Infection.—The degenerating joints appear more susceptible to infection often from a septic focus, and recurrent attacks of inflammation appear.

Toxæmia.—Osteoarthritic joints are susceptible to toxic inflammation from such states as gout, rheumatoid arthritis, allergy, endocrine imbalance, malnutrition, etc. In these cases we must endeavour to make a total diagnosis—that is, to discover all that is wrong with the patient. Too often we treat the patient in bits, though in practice it is difficult to do otherwise. We must be on the alert for the general causes of joint conditions. For example, the post-menopausal patient complaining of stiff and painful knees frequently has anæmia in addition to the endocrine disturbance, and may be suffering from malnutrition. Correction of these factors may result in cure of her joint symptoms, even though the X-ray picture is far from normal. Always question a patient about the diet, for many patients over middle age are content to live on a poor diet, largely of the tea-and-toast variety, deficient in proteins and vitamins.

A joint that has been previously damaged by infection or toxin may develop osteoarthritis subsequently. We must remember that the effects of infection and toxin may subside, leaving only a mechanical problem. We must be on our guard, lest we continue to treat as diseased a joint from which all such inflammatory activity has vanished as the result of treatment, for such joints can be safely exercised and manipulated.

Symptoms of Bony Origin.

Symptoms due to changes in the adjacent bone arise from the effects of associated circulatory conditions such as arteriosclerosis; hyperæmia, sclerosis or cystic changes occur, and by irritation of the nerves in the Haversian canals give rise to a continuous ache unaffected by activity or rest.

Comment.

The symptoms in cases of osteoarthritis arise in the various ways given above, and if their precise nature can be determined, suitable treatment will give relief. It is not always easy, however, as cases are of mixed type—mechanical, inflammatory due to bone sclerosis—and no one method will give complete relief. The elderly patient often has poor powers of recovery and may be very uncooperative. Pain in osteoarthritis is often of the referred type and may be an early and puzzling symptom as no local cause is found.

Minor Injuries and Osteoarthritis.

How do we explain the fact that a relatively minor injury may be followed by prolonged symptoms in those cases in which the X-ray picture of the joints shows marked osteoarthritic changes, which are stated to have been symptomless previous to the injury?

It has often been stated that latent disease has been activated or "lit up" by the minor trauma, and that the disease will continue to advance perhaps rapidly. Is it not more accurate and more helpful, from the point of view of treatment, to regard such symptoms as being due to an injury from which recovery is incomplete? Recovery from injury in a degenerating joint is slow and often imperfect. The power of repair is still present, and ordinary strains of an osteoarthritic joint will recover if they are treated properly.

To refuse treatment because of X-ray appearances is to miss many opportunities for affording relief. Many an elderly patient will recover from appendicitis or pneumonia under competent treatment. So also will the aged joint repair a sprain, or recover after removal of a loose body or a torn meniscus, or respond to treatment for mild infections or adhesions.

Major Injuries.

If the injury is a major one, much damage to the articular cartilage may occur, damage that is irreparable. As a result, the mechanics of the joint may be so altered that normal functioning of the joint thereafter produces self-inflicted injury, and therefore rapid degeneration may follow.

Treatment.

The objective in treatment is relief of pain and, to a lesser extent, of deformity and stiffness.

It is thought by some that certain factors affect the rate of degeneration, such as excessive or prolonged or occupational use, etc., and that if these are reduced, the rate of degeneration can be controlled to some extent, although osteoarthritis occurs in cases in which none of these factors appear to operate.

The first necessity is adequate explanation and reassurance and, if possible, avoidance of the word "arthritis". Instead, one should stress the effects of wear with aging and explain the symptoms as due to injury or strain. Attention to the general health is required, with the correction of any endocrine, infective or toxic factors and consideration of diet to avoid malnutrition or overweight. Fatigue should be prevented.

Activity and rest must be taken on the "little and often" principle, in order to aid the patients to preserve as normal a mode of life as possible. Complete rest encourages stiffness, over-activity brings strain. The patient can often, in this way, find a regime which considerably reduces his discomfort at once. For example, a farmer with an osteoarthritic hip may still run his farm, provided that he sits down for about one quarter of an hour after every hour of activity, does not walk more than about half a mile without rest, and avoids all the heavy tasks.

Light full-range movements are carried out once a day for a few minutes. This procedure helps to preserve the range.

In mechanically produced pain, active full-range exercises and manipulations are suitable, but frequently an operation to remove the mechanical cause, or arthroplasty or arthrodesis is indicated.

In the inflammatory cases, active and passive exercises and manipulation under anæsthesia may be required, after infection and toxæmia have been excluded or corrected.

BLOOD GROUPS AND DISEASE: CARCINOMA OF VARIOUS ORGANS.[1]

By GRACE PARKER AND R. J. WALSH,
From the New South Wales Red Cross Blood Transfusion Service, Sydney.

AIRD, Bentall and Roberts (1953) showed that the percentage of subjects of blood group O was lower and of blood group A higher among 3632 patients suffering from carcinoma of the stomach than among 10,000 controls. This finding was later expanded by Billington (1956*a* and 1956*b*), who demonstrated that the blood group distribution of patients suffering from carcinoma of the stomach differed according to the site of the lesion. The original investigation raised the question whether the blood group distribution of patients with carcinoma of other regions might also differ from that of the random population, but a number of investigations have yielded negative results.

The demographic features of carcinoma have received little attention, and it was thought that a survey similar to that performed by Aird and his co-workers should be undertaken in Australia with regard to carcinomata of various organs. This survey was supported by the New South Wales State Cancer Council, and the results are reported in this paper.

[1] This work was undertaken with the aid of a grant from the New South Wales State Cancer Council.

Materials and Methods.

The hospital records of patients suffering from carcinoma of the intestine, of the female genital organs, of the breast and of the lung were examined at the Royal Prince Alfred Hospital, Sydney Hospital, St. Vincent's Hospital, the Royal North Shore Hospital of Sydney, St. George Hospital and the Women's Hospital. All admissions to these hospitals between the years 1950 and 1956 inclusive were available; but patients were included in the survey only if the diagnosis of carcinoma had been confirmed by histological examination of material removed either at operation or at autopsy.

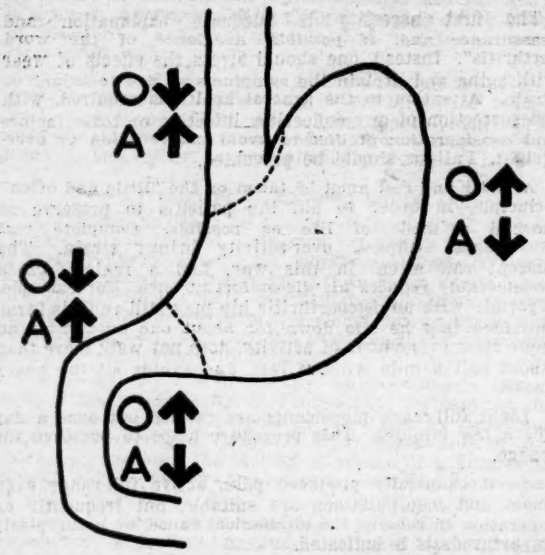

FIGURE I.

Diagrammatic representation of Billington's findings of the blood group distribution in carcinoma and peptic ulceration of the stomach and duodenum.

The blood group distributions were compared in three control populations from the Sydney area. The first was that found by de Burgh, Sanger and Walsh (1947) in a series of 30,000 blood donors tested in the years 1941 and 1942. The second was a series of unselected blood donors enrolled and grouped during 1955 and 1956, and was included to test the possibility that the influx of European migrants might have changed the blood group distribution. The third series was composed of 5117 patients admitted to Sydney Hospital during 1956 and 1957.

Results.

The distribution of the A B O groups in the three control series is shown in Table I. As far as the totals are concerned, the three series do not differ. However, there is a significant difference in the blood groups between male and female patients from Sydney Hospital.

The location of the carcinomatous tumours and the number of patients in each category were as follows: rectum, 340; recto-sigmoid junction, 49; sigmoid colon, 232; caecum and colon (other than sigmoid), 176; lung, 177; breast (scirrhous), 351; breast (other types), 203; cervix of uterus, 169; body of uterus, 122; vulva and vagina, 40; ovary, 63. When this was indicated, the blood groups of male and female patients were separately analysed, and the blood group distribution of each series was compared with that of the blood donors tested in 1956 and 1957. In no instance was the difference significant at the 5% level.

Discussion.

No explanation can be offered for the significant sex difference found in the distribution of blood groups in Sydney Hospital patients. During the period when these patients were tested, it was the practice at Sydney Hospital to test all patients admitted to surgical wards, irrespective of their condition, and all patients in medical wards who required blood transfusions. It has not been possible to investigate a comparable series of patients in another hospital in the Sydney area.

The negative findings in patients with carcinoma were not unexpected, because with two exceptions positive association with blood groups has so far been found only in patients suffering from diseases of the stomach and duodenum. The two exceptions are the finding by Struthers (1951) of a high frequency of blood group A among children dying of bronchopneumonia in Glasgow, and of a high frequency of group A in male patients suffering from diabetes mellitus, reported by McConnell, Pyke and Fraser Roberts (1956).

Summary.

The A B O blood group distribution amongst patients suffering from carcinoma of various regions of the body was investigated, the records of some large hospitals in Sydney being used. The sites included were the intestinal canal (except the stomach, which had already been studied by Billington), the lung, the breast and the female genital organs. In no instance did the blood group distribution differ significantly from that found in the control population. An interesting finding, which requires further investigation, was a significant difference in the blood group distribution among male and female patients admitted to one hospital.

There was no evidence that the recent influx of European migrants had altered the blood group distribution in Australia.

Acknowledgements.

The writers wish to acknowledge the grant from the New South Wales State Cancer Council, which enabled this work to be undertaken. They also wish to thank the medical superintendents and the staffs of the pathology and record departments of the hospitals where the survey was made.

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TABLE I.

Control Populations.

Blood Group.	Blood Donors, 1941 and 1942.	Hospital Patients, 1956 and 1957.[1]			Blood Donors, 1955 and 1956.		
		Males.	Females.	Total.	Males.	Females.	Total.
O	14,672 (48·91%)	1303 (50·83%)	1169 (45·77%)	2472 (48·31%)	530 (47·79%)	229 (48·11%)	759 (47·89%)
A	11,514 (38·38%)	928 (36·21%)	1035 (40·52%)	1963 (38·36%)	439 (39·59%)	181 (38·03%)	620 (39·12%)
B	2912 (9·70%)	237 (9·25%)	258 (10·10%)	495 (9·67%)	105 (9·47%)	55 (11·55%)	160 (10·09%)
AB	902 (3·01%)	95 (3·71%)	92 (3·60%)	187 (3·65%)	35 (3·15%)	11 (2·31%)	46 (2·90%)
Total ..	30,000	2563	2554	5117	1109	476	1585

[1] The difference in the distribution between male and female hospital patients is significant, $\chi^2 = 14.90$ for three degrees of freedom; p lies between 0·01 and 0·001.

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Reports of Cases.

PERFORATING FOLLICULITIS OF THE NOSE.

By G. F. DONALD,
Adelaide.

THE development of pustular folliculitis about the stiff hairs inside the anterior nares is a common occurrence, and the majority of such infections behave in a similar manner to pustular folliculitis in other hairy areas. After the appearance of a red tender papulo-pustule about the hair there is usually rapid healing, with discharge of purulent debris through the mouth of the hair follicle on to the mucosal surface of the anterior nares, and in many instances the affected hair is also extruded and replaced later by a new hair. Culver (1927) called attention to the fact that this sequence of events is not invariable, and under the title "Perforating Folliculitis Naris" gave an account of three cases in which the inflammatory products and involved hair were not discharged on to the nasal mucous membrane, but presented on the opposing skin surface of the ala nasi involved. Culver stated that he observed his three cases within the course of a year, and it is curious that in the ensuing thirty years no further cases are recorded in the world literature, with the exception of a report of a case by Palmer (1938). In discussing Culver's paper Sutton stated that he had seen three such cases, and it is unlikely that the condition is an excessively rare one. A useful purpose may be served by drawing attention to this simple disorder, particularly as the history and clinical signs are diagnostic, and may avoid recourse to biopsy and methods of treatment which are liable to produce obvious scars in this area.

The four cases previously recorded in detail have been in men, and all patients gave the history of having had a small sore on one side of the tip of the nose which had failed to heal after three to six weeks in spite of repeated expression and incision. On examination, a small crusted or pustular sore was visible, and measured two to three millimetres in diameter; in the centre of the lesion could be seen a dark spot which proved to be the end of a hair. When the hair was removed it was consistently found to be dark and thick, measuring up to 1·5 centimetres in length, and on close inspection the end grasped was the hair bulb. It is obvious from these findings that this condition is due to the deep extension of the inflammatory reaction which carries with it the involved hair, and that the process dissects laterally until the skin surface is reached. The presence of a hair in the infected tract ensures the continuation of the inflammatory reaction, and in the four reported cases there was prompt healing as soon as the involved hair had been removed.

Report of a Case.

Mr. A., aged 32 years, a former Albanian, was seen in January, 1958, because of a small tender lump which had been present on his nose for approximately two months. The patient stated that on the previous day, when he removed the small central scab, he noticed a coarse hair at least a quarter of an inch in length adhering to the under surface of the crust. On examination, an irregularly raised fleshy papule three millimetres in diameter was present on the left ala nasi, having an ill-defined erythematous margin and a depressed centre which was covered by a small crust. It was ascertained that the patient was subject to pimples inside his nose, and that a tender lump had been present on the opposing mucosal surface of the left ala nasi for about six months. This lesion had slowly resolved during the month preceding the date of examination, and there were no abnormal changes detectable inside the nose, apart from slight localized erythema. When seen ten days later the mucosal surface of the patient's nose appeared normal, the fleshy nodule on the skin was distinctly flatter, and all purulent discharge had ceased. These changes are shown in the accompanying photograph (Figure I), which was taken

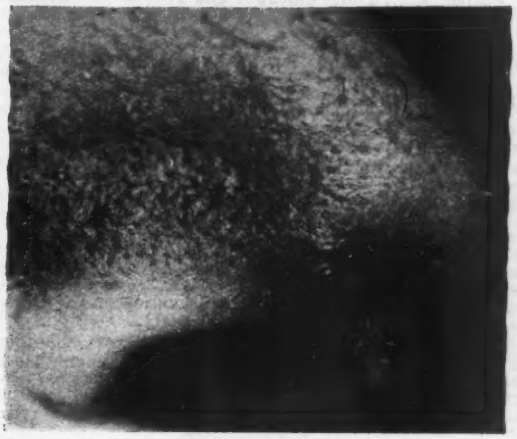

FIGURE I.

at this second visit. In view of the nature of the disease it was thought that no active treatment was required, as spontaneous cure could be anticipated confidently, after the removal of the offending hair from the infected tract by the patient.

Summary.

Perforating folliculitis of the nares is briefly discussed, and a fifth case is reported. As in previous cases the continuance of the condition is dependent on the presence of a hair within the infected tract, and the discharge and inflammatory response cease promptly as soon as the hair is removed. It is probable that the condition is far more common than the paucity of reports would suggest, and it is to be remembered when considering the clinical diagnosis of indolent sores or tender lumps near the tip of the nose.

Acknowledgements.

I wish to thank Mr. J. N. Tomlinson, of the Adelaide Children's Hospital, for the excellent black and white print made from the original transparency.

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Reviews.

The Year Book of Ophthalmology (1957-1958 Year Book Series). Edited by Derrick Vail, B.A., M.D., D.Oph., F.A.C.S., F.R.C.S.; 1958. Chicago: The Year Book Publishers, Inc. 7¼" × 5", pp. 424, with 90 illustrations. Price: $7.50.

FOR the first time in this issue, a member of the Year Book series is devoted exclusively to ophthalmology, which has been combined for over fifty years with ear, nose and throat. The editor of the new book, Derrick Vail, carries on from his joint editorship in the previous combined volume. The new arrangement has made it possible to double the number of abstracts and editorial comments. The volume opens with a special article on recent advances in ocular therapy by Irving H. Leopold, of Will's Eye Hospital of Philadelphia. The various abstracts are grouped into sections on the orbit

and adnexa, the conjunctiva and the cornea, refraction and motility, the uvea, the lens and cataract, the vitreous and retina, neurology and visual fields, glaucoma, therapy, surgery and miscellaneous subjects. This new Year Book is to be welcomed, as it gives its rightful place to an important specialty.

The Year Book of General Surgery (1957-1958 Year Book Series). Edited by Michael E. De Bakey, B.S., M.D., M.S., with a section on "Anesthesia" edited by Stuart C. Cullen, M.D.; 1957. Chicago: The Year Book Publishers, Incorporated. 7¾" × 5¼", pp. 560, with 128 illustrations. Price: $7.50.

SINCE the publication of last year's issue of this Year Book, its distinguished editor, Evarts A. Graham, has died, ironically enough from carcinoma of the lung, a disease to which he had devoted a great deal of attention. His death was unexpected, and he had already begun making the selections for the present volume when it occurred. At short notice the editorship was taken over by Michael E. De Bakey, who is Professor of Surgery and Chairman of the Cora and Webb Mading Department of Surgery, Baylor University College of Medicine. The volume rightly opens with a photograph and an appreciation of Dr. Graham. A short introduction by the new editor is followed by chapters on general considerations, shock, fluids and electrolytes, wounds and wound healing, neoplasms and the thyroid and parathyroids, a series of chapters dealing with the various main areas of the body, and a separate chapter on hernia.

The second part of the book, which deals with anæsthesia, continues under the editorship of Stuart C. Cullen. He has divided his material into chapters on depressant drugs, ventilation and circulation, inhalation, relaxants, barbiturates, regional anæsthesia, spinal anæsthesia and miscellaneous subjects.

There is a great deal of material from a wide range of journals packed into this Year Book, which should be found valuable by all who are concerned with general surgery or anæsthetics.

Alfred Hospital Clinical Reports. Edited by R. S. Lawson; Volume 7; 1957. Melbourne: Alfred Hospital. 9¾" × 6", pp. 108, with many illustrations. No price stated.

THIS latest volume of the *Alfred Hospital Clinical Reports* opens with an interesting and informative account of Hamilton Russell by W. G. D. Upjohn. It is a timely article, helping to bring into our generation a touch of the inspiration that Russell brought to men of his own day. Other papers in this volume deal with ulcerative colitis at the Alfred Hospital during the ten-year period 1945-1955, carcinoma of the breast, post-operative deep X-ray therapy for carcinoma of the breast, wound infections, perforated peptic ulcer, acute cholecystitis, and a series of case reports. The volume is as usual well produced, and is a credit to the hospital from which it comes.

Clinical Orthopædics. Number 10. Editor-in-chief, Anthony F. De Palma, with the assistance of the associate editors, the Board of Advisory Editors and the Board of Corresponding Editors. 1957. Philadelphia and Montreal: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 10" × 6¾", pp. 384, with many illustrations. Price: 82s. 6d.

THIS volume is Number 10 in a series in symposium form issued under the auspices of the Association of Bone and Joint Surgeons in America. The series is designed for the publication of original articles offering significant contributions to the advancement of surgical knowledge. The submission of contributions is invited, so that the book is of the nature of a journal published twice a year. The main part of the present volume is concerned with affections of growth centres (epiphyses and apophyses). Shorter sections are concerned with the pathological physiology of metabolic bone disorders, general orthopædics, and a number of short subjects. The volume is well worth the attention of orthopædic surgeons.

Transactions of the International Society of Plastic Surgeons. First Congress, edited by Tord Skoog, M.D., and Robert H. Ivy, M.D.; 1957. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" × 6¼", pp. 584, with 467 illustrations. Price: £11.

AT the annual meeting of the Scandinavian Association of Plastic Surgeons, held in Gothenburg in 1953, it was decided to arrange an International Congress of Plastic Surgery to be held in 1955. As a result, such a congress was held in Stockholm and Upsala in August, 1955, and an International Society of Plastic Surgeons was formed. The present volume gives an account of this new society and its formation, and reproduces the papers presented to the congress. There are chapters devoted to burns, cleft lip and palate, clinical and experimental research, miscellaneous subjects, and the various anatomical areas with which plastic surgery is particularly concerned. The volume is well prepared and printed.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Progress in Psittacosis Research and Control", edited by F. R. Beaudette, with a foreword by Richard E. Shope; 1958. New Brunswick, New Jersey: Rutgers University Press. 9¼" × 6", pp. 286, with many illustrations. Price not stated.

A record of the proceedings of the second symposium on psittacosis held in New York in February, 1956.

"Human Groups", by W. J. H. Sprott, 1958. Victoria: A Pelican Book. 7¼" × 4¼", pp. 224. Price: 5s. 6d.

"A study of how men and women behave in the family, the village, the crowd and many other forms of association."

"Coffee and Caffeine", by Rolf Ulrich, translated by Janet Ellingham; 1958. Bristol: John Wright and Sons, Limited. 8¼" × 5¼", pp. 52. Price: 7s. 6d. (English).

A compilation of the literature on coffee and caffeine.

"The Sudan Medical Service: An Experiment in Social Medicine", by H. C. Squires, C.M.G., D.M., F.R.C.P., D.P.H.; 1958. London: William Heinemann (Medical Books), Limited. 8¼" × 5¼", pp. 150, with seven illustrations. Price: 15s. (English).

The author was associated with the Sudan Medical Service for almost forty-three years.

"Practical Biology for Advanced Level, Medical and Intermediate Students. Volume II: Practical Botany", by C. J. Walles, M.A.; Fourth Edition. London: William Heinemann (Medical Books), Limited. 8¼" × 5¼", pp. 186, with 71 illustrations. Price: 17s. 6d. (English).

The title is self-explanatory. This volume has previously been combined in a single volume with that now published as "Practical Zoology".

"Fundamentals in Cardiology", by John B. Wild, M.D.; 1958. Oxford: Blackwell Scientific Publications. 9¼" × 6", pp. 96, with many illustrations. Price: 34s.

The author sets out to correlate for the student the findings of clinical examination with those of more technical procedures.

"An Introduction to Pathology", by G. Payling Wright, D.M., F.R.C.P.; Third Edition; 1958. London, New York and Toronto: Longmans Green and Company. 8¾" × 5¾", pp. 672, with many illustrations. Price: 68s.

A fully revised edition of a book intended mainly for students who are about to enter the clinical period of their training.

"Textbook of Surgery", edited by Guy Blackburn, M.B.E., M.Chir., F.R.C.S., and Rex Lawrie, M.D., F.R.C.S., M.R.C.P., with a foreword by Sir Russell Brock, M.S., F.R.C.S.; 1958. Oxford: Blackwell Scientific Publications. 9¾" × 5¼", pp. 1136, with many illustrations. Price: 84s. (English).

A text-book for undergraduates prepared by two surgeons from Guy's Hospital.

"Immunization Information for International Travel", prepared by the Epidemiology and Immunization Branch Division of Foreign Quarantine of the Bureau of Medical Services, United States Public Health Service. Washington: U.S. Department of Health, Education and Welfare, Public Health Service. 6" × 4½", pp. 72. Price: 30c.

A booklet prepared in the United States for the convenience of persons planning to travel abroad.

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THE TREATMENT OF DISEASE OF THE THYROID BY IRRADIATION.[1]

By W. P. HOLMAN,
Medical Director, Cancer Institute Board, Melbourne, Victoria.

AT the Australasian Medical Congress (B.M.A.) held in Melbourne in August, 1952, there was a discussion of the use of radio-iodine in the diagnosis and treatment of some thyroid disorders. The group working at the Royal Melbourne Hospital were represented among the speakers, and what they presented was certainly a preliminary report, based as it was on the treatment of only 13 patients in whom the main clinical indications could all be called uncommon. In the few years which have passed, the views of this group have changed in some important aspects, and now appear reasonably stable. It may be of interest to describe some of the changes.

The original very discriminating choice of patients has for some time been modified, and effect has been given to the view that this is the treatment of choice for patients with smooth toxic goitres, and that the only clear contraindications are the presence of pregnancy after the twelfth week, and lactation.

TABLE I.
Royal Melbourne Hospital: Radio-Iodine in Thyroid Disease.

Year.	New Patients Treated.	Repeat Doses	Repeat Doses Same Year.
1948 ..	1	—	—
1949 ..	1	—	—
1950 ..	3	—	—
1951 ..	5	1	—
1952 ..	9	2	—
1953 ..	14	6	—
1954 ..	51	1	1
1955 ..	60	7	4
1956 ..	55	6	3
1957 ..	99	6	8

That this view is being increasingly accepted in Melbourne is shown by the growing number of patients treated by the group, apart from those more recently treated at other hospitals in that city.

Another significant change has been the adoption of a single dose, as opposed to the original multiple fractional doses. In the earlier discussion, these divided doses were given as one to eight millicuries, chosen to give a dose within the gland of 5000 equivalent *r* of beta radiation. This was, of course, the period when there were varied but almost universal attempts to prescribe clinical dosage with physical precision.

In many centres, including our own, a rather daunting mathematical approach was based on physiological and anatomical assumptions which in retrospect look rather ingenuous. The dose, in whatever units it was specified, depended on a reasonably accurate estimate of the size of the gland; it was assumed that distribution of the isotope within the gland was nearly uniform, and, perhaps of less importance, that the level of radiosensitivity did not vary widely. In fact, even in the most experienced hands, estimates of gland size have been shown to be in error by at least 100%, and two careful observers have described a case in which they agreed that there was no thyroid enlargement, but at subsequent surgery a gland weighing 100 grammes was removed. Studies of the distribution of the radioactive iodine with the use of radioautography showed an expected wide variation in cases of cancer and of toxic nodular thyroid, and to a lesser degree in cases of smooth toxic thyroid.

Finally, a quite contradictory view has been taken by different workers of the method of altering dosage for different degrees of toxicity. Our own group initially reduced the dose in the presence of severe toxicity, because of the radiotherapist's previous experience of increased radiosensitivity in these circumstances when using X-ray therapy, while other considerations have led some clinicians to increase the dose for exactly the same condition. This group has passed, rather more quickly than some overseas workers, through the usual stages of diminishing complexity of physical calculations of dosage to its present simple empirical method.

At present, a dose of seven millicuries is regarded as the standard. If the goitre is called large, one millicurie is added; if it is very large, two millicuries are added. If the goitre is small, and also frequently in post-operative recurrence, one millicurie is deducted. The measured retention of the radio-isotope in the gland after 24 hours may sometimes influence the dosage. In the earlier part of this period one millicurie was deducted after retention was shown to be greater than 70%; but later, when the percentage proved to be 60% or upwards, no alteration was made. If it was between 50% and 60%, one millicurie was added, if it was between 40% and 50%, two millicuries were added. If it was under 40%, no therapy was undertaken until efforts had been made to discover the cause of the low retention—for example, previous medication. This was corrected when possible and a low iodine intake was arranged.

This uncomplicated approach to dosage was heretical when it was first considered; but now clinicians of wide experience—for example, Myant and Pochin (1955) at University College Hospital, London, and Alistair Macgregor (1957), now at Edinburgh, but remembered for his work in Sheffield—use the same general reasoning. As Macgregor puts it, "the size of the dose being judged on the simple principle of a small dose for a patient with a small gland, and a large dose for a patient with a large gland".

It will be remembered that older experience with X-ray therapy for this condition had shown that the clinical response to treatment was delayed for periods of six to 12 weeks. In the 1952 Congress discussion, it was mentioned that an investigation was being carried out at the Royal Melbourne Hospital of the effect of antithyroid drugs given at different periods before and after tracer doses of radio-iodine on its effective half-life. Eventually, it was shown that when the severity of the clinical state requires it, antithyroid drugs may be given up to two days before the dose of radio-iodine and their administration recommenced two days later if necessary. It should not be continued for more than six weeks as a maximum. By that time a significant clinical effect from the radio-iodine should be noticeable, and there is no need to risk the complication of persistent or even increased enlargement of the gland.

The results of treatment obtained in a series of patients who were treated before December 30, 1955, have pre-

[1] Read at a plenary session on thyroid disease, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

TABLE II.
Results of Treatment of Diffuse Toxic Goitre with a Single Oral Dose of ^{131}I.

Basic Dose of ^{131}I. (Millicuries.)	Results.	Dosage in Millicuries.						Total.
		4	5	6	7	8	9	
7	Excellent	—	1	12	10	2	1	26
	Hypothyroidism	—	—	1	1	—	—	2
	Persistent goitre with euthyroidism	—	—	—	1	2	1	4
6	Excellent	2	9	4	—	—	—	15
	Hypothyroidism	1	—	—	—	—	—	1
	Persistent goitre with							
	(*a*) Euthyroidism	1	6	1	1	1	—	10
	(*b*) Hyperthyroidism	—	4	2	—	—	—	6
Total	Excellent	2	10	16	10	2	1	—
	Unsatisfactory	2	10	4	3	3	1	—

viously been reported (Fairley *et alii*, 1956). Table II is taken from that paper. A further series of treatments given up to the end of December, 1956, is analysed in Table III. Nineteen patients were excluded; 11 had nodular goitres; five had not been sufficiently followed up: in two cases at the beginning of the period the base line dosage was six instead of the present seven millicuries; and there was one patient who vomited the dose immediately. There were thus left for the analysis 68 cases. It is of interest that in this group there have been no examples of myxœdema.

Table IV indicates the result of treatment in those patients who required a second dose. Of the 12, two were excluded because it was thought that insufficient time had elapsed since their treatment.

Radio-Iodine in Toxic Nodular Goitre.

So far, nothing has been said of the place of radio-iodine in the treatment of toxic nodular goitres.

TABLE III.
Results of Treatment of Diffuse Toxic Goitre with Single Oral Dose of ^{131}I

Results.	Dosage in Millicuries.						Total.
	5	6	7	8	9	10	
Excellent	3	22	13	3	1	—	42
Hypothyroidism	—	3	—	—	—	—	3
Persistent goitre with							
(*a*) Euthyroidism	—	4	2	2	1	1	10
(*b*) Hyperthyroidism	2	5	4	—	2	—	13

We have always agreed with the common view that the first choice of treatment here is a surgical subtotal thyroidectomy. The distribution of radio-iodine in these glands is, of course, quite irregular, and it is a general experience that it is necessary to use relatively and undesirably large quantities, of the order of 15 to 20 millicuries, as single doses. Even then in the few patients we have treated, marked reduction in the size of the goitre has been unpredictable. On the other hand, J. L. Grove's experience in northern Tasmania during the same period has led him to a very different opinion.

Radiation Hazards.

At present it is particularly relevant to consider radiation hazards.

The possibility of the production of carcinoma of the thyroid after a long latent period has persuaded many to deny this treatment to patients aged under 40 years. Sixteen years have passed since it was first used in Boston and we have not heard of such a case. Neither the level of dosage nor the timing used parallels those associated with any carcinogenic effects of radiation.

We have seen two cases of leukæmia reported from the United Kingdom following the use of radio-iodine for thyrotoxicosis. Acute myeloid leukæmia occurred in a patient, aged 67 years and four months, whose toxic nodular thyroid had been treated 18 months previously with a single dose of 17 millicuries of ^{131}I; and acute lymphoblastic leukæmia occurred in a patient, aged 41 years and five months, whose thyrotoxicosis had been treated by a dose of 7·0 millicuries of ^{131}I 28 months before. An analysis of both cases suggests that the coincidence of the two conditions was likely to be due to chance.

The genetic hazards of radiation have also to be considered.

Table V has been produced by K. H. Clarke, using results obtained by Myant (1956). It analyses the radiation received by various tissues in thyrotoxic patients, from circulating radio-iodine in the iodine phase (column I) and in the thyroxine phase (column II), which in both cases will be due almost entirely to beta radiation, and from the gamma radiation from concentrations of radio-iodine in thyroid, bladder and stomach (column III). These radiation dosages are given in rads per millicurie, and are summed in column IV.

From the figures in column IV it can be seen that the radiation received from tracer doses of ^{131}I, of the order of 20 microcuries, is extremely small for all tissues except the thyroid, which would receive about 30 rads.

The figures given in columns I to IV are based on tracer investigations. It is suggested that during radio-therapy (of the order of seven millicuries), the fraction of radio-iodine appearing in hormonal form will be smaller than that during tracer tests, because of the effect of the radiation on the thyroid, and an approximation has been made by taking 60% of the figures in column II as applying in such cases. The radiation doses received by

TABLE IV.
Results of Treatment following a Second Dose of ^{131}I.

Results.	Dosage in Millicuries				Total.
	6	7	8	9	
Excellent	5	1	1	—	7
Persistent goitre with					
(*a*) Euthyroidism	—	1	1	—	2
(*b*) Hyperthyroidism	—	—	—	1	1

the various tissues from a seven-millicurie dose of radio-iodine are given in column V. It will be seen that from a therapeutic dose of seven millicuries the tissue on average receives four rads, and this can be taken as the whole-body radiation; the reproductive organs receive 10 rads, which is of the same order as from some diagnostic radiographic procedures; the kidneys receive about 50 rads, and the stomach and salivary glands about 140 rads. The thyroid during this treatment receives about 10,000 rads.

Radio-Iodine in Carcinoma of the Thyroid.

Some reference to the place of radio-iodine in the treatment of carcinoma of the thyroid may well be expected.

The incidence of cancer of the thyroid is difficult to discover, but one survey in the United States concluded

TABLE V.

Radiation Received by Various Tissues from ^{131}I in Thyrotoxic Patients.[1]

Tissue.	From Circulating ^{131}I.		Gamma Radiation from ^{131}I in Thyroid, Bladder or Stomach. (Rads per Millicurie.) III.	Total. (Rads per Millicurie.) IV.	Total Rads from Seven Millicuries. ($7(a+0{\cdot}6b+c)$.)[2] V.
	Iodine Phase. (Rads per Millicurie.) I.	Thyroxine Phase. (Rads per Millicurie.) II.			
Plasma	0·6	3·4	—	4	18
Average tissue	0·2	0·7	—	1	4
Muscle and bone	<0·6	<3·4	—	4	18
Ovary	<0·6	1·4	0·02	2	10
Testis	<0·6	1·4	—	2	10
Pituitary	<0·6	0·9	6·0	8	50
Liver	<0·6	6·8	—	8	33
Bladder (inner wall)	1·4	—	—	2	10
Kidney	0·6–2·8	<3·4	4·0	8–10	46–62
Stomach and salivary gland	18·0	<3·4	—	22	140
Thyroid	—	—	—	~1500	~10,000

[1] Figures in columns I to IV are based on data from tracer studies.

[2] The factor of 0·6 in column V is an approximation for the reduced fraction of ^{131}I appearing in hormonal form following therapeutic doses (seven millicuries).

that it was close to one case per month per million of population; of these cases, it is probable that in only about one in ten will the tumour be effectively avid for iodine.

On the other hand, when it was realized about 15 years ago that it might be possible to induce, at any rate, one type of widely metastasizing cancer to commit suicide during its ordinary metabolism, the emotional stimulus was provided for the spending of money on salaries for medical physicists and the equipping of their laboratories. This happy issue might well have been long delayed had it been merely a part of a changing clinical management of hyperthyroid states.

Two individual cases will be described.

Mr. A., aged 34 years, presented with very large pulsatile and osteolytic lesions in the upper part of his right humerus, the upper part of his sacrum, and the right wing of the ilium. Drill biosy produced material showing colloid-containing vesicles of quite regular arrangement, the classical "benign metastasizing struma". After total thyroidectomy, which disclosed the primary lesion in the left lobe of the gland,

TABLE VI.

Source. (Dose of ^{131}I.)	Gamma Ray Dose Rate at One Metre. (Rads per Hour.)	Dose Rate at One Metre as Fraction of M.P.D. (0·006 Rad per Hour.)	Gamma Ray Dose Rate at Two Metres. (Rads per Hour.)	Dose Rate at Two Metres as Fraction of M.P.D. (0·006 Rad per Hour.)
10 microcuries	0·000003	1/2000	—	—
100 microcuries	0·00003	1/200	—	—
1 millicurie	0·0003	1/20	—	—
10 millicuries	0·003	1/2	—	—
100 millicuries	0·03	5×	0·007	1×

uptake of ^{131}I in the region of the metastasis was shown to be high. During approximately 12 months, he was given 824 millicuries of ^{131}I by mouth in fractions, usually at intervals of four weeks. After each dose there was a fall in the peripheral white cell count which recovered quite sharply during the fourth and fifth weeks (Table VI). Radiographic evidence of reconstitution of bone did not appear until deep X-ray therapy was added to a tissue dose in some places as high as 3000*r* given in four weeks. On the other hand, some local pain had been relieved and his general state improved. This improvement continued for about 18 months. During one short stage his doctor prescribed thyroid extract rather irregularly. The patient was then given a "maintenance dose" of 100 millicuries of ^{131}I. Within four months of this he died with uncontrolled metastases, and material obtained at a post-mortem examination showed many of them to be anaplastic.

Perhaps the very size of the volume of metastases meant too much dilution of the internal radiation; but in addition it is probable that in a general sense the distribution within the bulky metastases was grossly irregular.

Mrs. B., aged 34 years, when first examined at the Cancer Institute Board, had been treated by deep X-ray therapy, at the age of 19 years, at another hospital for swellings in the left posterior cervical triangle. There is no record then of a biopsy. In 1953 she was discovered to have multiple spherical opacities in the lungs, which were regarded as metastases. She was given X-ray therapy to the thorax in that hospital, and there was said to be no response. She was symptomless until March, 1955, when she complained of tightness in the chest and some irritating coughing. After a total thyroidectomy, which showed a highly differentiated papillary carcinoma, ^{131}I was given in fractionated doses from June 1 to November 21, 1955, to a total dose of 367 millicuries. Since then the radiographic appearances in the chest have been considered to be normal, and her symptoms, never striking, are said to be relieved. She is still well, and has been taking 0·5 grain of thyroid extract per day quite regularly.

These unusual metastasizing tumours, which are normally recognized before the patient reaches the age of 40, and which almost uniformly have a long life history, are worth special attention. They have been studied by Crile of Cleveland, whose papers have been of particular interest. In his last paper (1957), in which he reminds us of Thomas Dunhill's pioneer work of 22 years ago, he has produced very convincing evidence that this is a hormone-dependent tumour, and he has demonstrated the disappearance of multiple metastases in several patients as a result of the use of thyroid extract, usually in a dosage of three-quarters of a grain per day. This he believes to be due to the suppression of thyroid-stimulating hormone (T.S.H.). Crile also has continued to draw attention to the probability that when a state of gross hypothyroidism is produced either by surgery or by irradiation with ^{131}I, then the resulting increased production of T.S.H. may cause a well-differentiated carcinoma to dedifferentiate and become anaplastic.

Perhaps, then, there is no real place for the use of massive doses of ^{131}I, with its high cost and the need for meticulous ritual on the part of personnel, in the treatment of this very uncommon condition. On the other hand, there will continue to be occasions when X-ray therapy in its more effective modern forms will be of value for local growth restraint of some primary tumours or their metastases in lymph nodes, and for the relief of pain from metastases in bone.

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INDICATIONS FOR SURGERY IN THYROID GLAND DISEASE.[1]

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IT is hoped that in the future there will be less for the surgeon to do in thyroid disease, as advances in prophylaxis and medical management prevent the abnormal development and secretions which now occur.

The reasons for surgical treatment at the present time are as follows: cosmetic considerations; mechanical pressure; over-secretion, when medical treatment has failed; and diagnostic, when malignant disease is a possibility. Any one of these reasons may by itself be sufficient grounds for operating; but more often it is a combination of minor degrees of several of these factors which makes surgery necessary. Fortunately, the terrors and dangers of the early days of surgery of the thyroid gland are now absent. Now it may be said that mortality is negligible, morbidity is minimal, sequelæ are controllable, and cosmetic results are excellent. However, even as inexpert medical treatment will not give a satisfactory result, so inexpert surgery may give rise to the crippling complications of recurrent nerve damage and parathyroid deficiency—either of which, fortunately, is rare.

The commonest and most persistent misfortune of surgery is some mild degree of subthyroidism; but as this is also possible after medical treatment, and as it is a condition which is very easily controlled by the exhibition of tablets of thyroid extract, it is of minor significance. The reason for the frequency of this complication is that the amount of thyroid gland to be removed in each individual has to be determined empirically, and thus must depend on the judgement of the surgeon. Being too conservative with a surgical removal may necessitate another operation, whereas if a slightly excessive amount is removed, all that is required is thyroid replacement therapy. Thus the surgeon naturally tends to be rather more radical than conservative in estimating the amount of gland to be removed.

To consider in more detail the indications for surgery, it is best to discuss the problem under the six main clinical groups of thyroid disease, which are as follows: single adenoma, colloid enlargement, nodular goitre, Graves's disease, intrathoracic goitre and malignant disease.

Although there are these six groups, there are cases which show characteristics of two or more of the groups, and also we have all seen how a typical case in one group can change into a slightly atypical case in another group; but it is important to remember that this progression from one group to another is not inevitable, though it occurs commonly enough to require consideration in giving a prognosis to any patient with a goitre.

The Single Adenoma.

The single adenoma is a clinical diagnosis, and in the young patient it is likely to be correct; but the older the patient, the more likely it is that what appears to be a single lump turns out to be the only palpable nodule in what at operative exposure proves to be a multilobulated nodular gland. It is practically universally advocated that a single nodule should be treated surgically, for several reasons. The first is the risk that carcinoma may either already be present or may develop later, and the younger the patient, the greater is the likelihood that the condition will be proved malignant or pre-malignant. Fraser and Dunhill state that 80% to 90% of cases of thyroid carcinoma arise from pre-existing adenomata, whilst Lahey and Hart state that 10% of discrete adenomata are on microscopic examination found to be malignant. This latter figure is higher than in Melbourne, where it is found that approximately only 4% are malignant. This is due to the stricter standards of microscopic evidence adopted in Melbourne, and is more in keeping with the subsequent clinical course of these adenomata as observed in the days before adenectomy was recommended for the single adenoma. Secondly, there is the probability that mild toxicity will develop in the single adenoma after 10 years or so of inactivity; this again was the finding when one did not operate on these nodules. The third reason is the risk of hæmorrhage with sudden obstructive symptoms. However, although small hæmorrhages are common, this risk of obstruction is very slight; although old hæmorrhagic areas are often found in the adenomata, hæmorrhages large enough to cause acute dangerous pressure are rare, and usually do so only if the lump is in a retrosternal position. I myself remove the single nodule with its surrounding gland, and macroscopically examine the nodule and its capsule. I then incise the adenoma and inspect its surface, and if it arouses suspicion of carcinoma but has an intact capsule, I remove all the thyroid of the side involved. Ideally a frozen section should be obtained; but in some of these adenomata the section presents a difficult histological problem, and is as likely to be misinterpreted as the macroscopic appearance. I admit that theoretically a hemithyroidectomy is an incomplete operation for carcinoma; but if the capsule is intact, I think it is a justified calculated risk, as the disease is localized in the early stage. A total thyroidectomy with its risks of tetany and laryngeal paralysis, for what is probably a type of carcinoma-in-situ, is, I think, unnecessary. If, on the other hand, the capsule is ruptured and there is obvious spread through the capsule, a total thyroidectomy with bilateral block dissection of glands of the neck is performed. In many adults at operation it is found that the lump is the largest and the only palpable nodule in a nodular gland, and in such a case a subtotal thyroidectomy with removal of all possible nodules is performed.

The Colloid Goitre.

The colloid goitre, which presents no trouble in diagnosis, also allows an easy decision on treatment. As a prophylactic iodine is of undoubted value, and also in the early stages of enlargement iodine and thyroid extract may produce regression and cure; but after a few years of the established state the gland becomes fixed, and then this therapy has little effect on its size. If the goitre is causing cosmetic and psychological worry or pressure effects, the treatment is surgical removal of the excess thyroid tissue. Great care must be taken not to remove too much gland in these cases, so as to avoid the development of subthyroidism during later stages of life such as pregnancy, which may require increased thyroid output.

The Nodular Gland.

The nodular gland may be non-toxic or toxic. The non-toxic, slightly enlarged gland with nodules presents to my mind the most debatable problem in goitre surgery. If the gland is large and ugly, then cosmetic reasons will usually demand a subtotal thyroidectomy; similarly if the X-ray picture shows pressure effects or deviation of the trachea. But what of the small, irregular gland in the woman of about 35, in perfectly good health, without any psychological upset and no pressure or disfigurement? I think the present advice given by physicians is to wait and see, and to keep the patient under observation and possibly to give a little iodine; but surgeons, on the other hand, have been inclined to advocate subtotal thyroidectomy, on the grounds that the gland may become either toxic or malignant, or will increase in size, and so will need to be removed sometime, so why not now? I myself am rather unhappy with this surgical trend. It does not seem quite logical to me to try to prevent the development of carcinoma by a subtotal thyroidectomy, as it is impossible to determine in what site the carcinoma will start. In any case, according to Lahey, malignant change occurs in only approximately 0·6% of the group. Secondly, I wonder why one should operate to prevent a toxic change which, after all, may never occur, or if it does occur, usually has a slow, insidious onset, which can be readily detected if the patient is kept under observation, and then may be dealt with according to its severity.

[1] Read at a plenary session on thyroid disease, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

Thirdly, with regard to disfigurement, I think that the patient should be the sole judge of when she regards it as causing embarrassment. We have all seen numbers of perfectly healthy old women with a small nodular goitre with which they have lived for years, so why should they be put through the worry and financial stress of an operation? I prefer to leave women at the age of about 35 unless there is cosmetic worry, but warn them that reconsideration may be desirable at the menopause. Another reason for leaving them at this age is that, if they are operated on, and if later physiological stresses occur (for example, pregnancy), which produce an increased demand for thyroxin, then the gland enlarges again, and the patients may require a second thyroidectomy in ten years or so.

If the nodular glands are first found at about the menopause, these cases become a most difficult problem, because at this time there is a general glandular upset which may produce symptoms very like those of mild thyroid overactivity. When patients present with these symptoms of anxiety and tachycardia, etc., I usually perform a subtotal thyroidectomy; but I find that a few of this group show very little symptomatic improvement, apart from the immediate psychological improvement and that due to bed-rest. I do not find the estimation of the basal metabolic rate of any value in trying to determine which patients of this group will benefit.

For the patient with definitely toxic nodular goitre, or cardiac nodular goitre, I think subtotal thyroidectomy is at present the correct treatment. This type of thyroid does not respond nearly so well to antithyroid drugs, and recurrence is more frequent, so that surgery is usually inevitable.

Graves's Disease.

With regard to Graves's disease, no surgery is ever attempted while there is any toxicosis present. The patient is always first rendered euthyroid by medical treatment, and then is reassessed from the point of view of appearance, pressure and ease of subsequent continuation of treatment and observation over the months that must elapse before she can be pronounced cured. Even with most expert medical treatment with either anti-thyroid drugs or radioactive iodine, a certain number of patients will still have an enlarged gland, occasionally even some pressure, and these will require removal of excess gland. Some patients live in areas where continued medical observation is difficult, and these also are better advised to have a subtotal thyroidectomy. If symptoms have occurred after a good remission, surgery is probably better than a second course of medical treatment.

The use of radioactive iodine is an excellent form of treatment, and our Melbourne experience suggests that it will probably supersede surgical treatment in women past the child-bearing age; but I believe that there may be many unknown effects of this treatment on future generations by action on the genes or possibly later carcinogenic effects. Theoretically, we are assured that the amount of radiation involved is unlikely to produce these effects; but until this is proved in practice, I believe it is better to be safe than sorry, and therefore to avoid this treatment in young people, and particularly in females before the menopause.

The patient in this group who gives most trouble in diagnosis is the nervy and anxiety-ridden female who has a small puberty enlargement of the thyroid. The difficulty here is the fact that continued anxiety is one of the primary factors which may start off toxicosis, and we have all seen patients with a typical anxiety state which a year later has become a typical toxic goitre with exophthalmos. We know that few neuroses will become toxic goitres, and to perform thyroidectomy on a patient with a pure anxiety state is a tragic mistake, as it usually only increases the anxiety and produces no improvement. Therefore, if one is in doubt, the wisest course is to wait and see, and if possible to relieve the cause of the anxiety. If I am in very much doubt, I may give a therapeutic trial course of "Neomercazole" to try to prove the diagnosis. Again I find that estimation of the basal metabolic rate seldom gives decisive readings in doubtful clinical cases. To summarize the treatment of Graves's disease, I advocate medical relief of the toxic condition by radioactive iodine if the patient is aged over 45 years, or by "Neomercazole" if she is younger, followed by reassessment of the need for surgery for cosmetic, pressure or geographical reasons.

Intrathoracic Goitre.

Intrathoracic goitre is much more commonly diagnosed since the introduction of routine miniature radiography in chest surveys. By this means a few completely discrete thyroid nodules unconnected with the gland in the neck have been observed; but the great majority of these goitres are extensions of the lower pole, usually of the left side below the sternum. Fortunately these intrathoracic glands are rarely toxic, and are manifest only by pressure symptoms of dyspnœa and tightness in the neck or distension of neck veins. It may be said that once intrathoracic extension is diagnosed, operation is imperative, because, as there are no firm structures in the mediastinum impeding increase in size, growth may be fairly rapid and may produce increasing pressure at the thoracic inlet.

I should like to protest here about the tendency to try to subdivide these intrathoracic extensions into anterior and posterior mediastinal extensions, as though they presented entirely different operative problems. This division has apparently arisen from operative difficulties encountered by thoracic surgeons removing these extensions by a thoracic approach. To my mind such a procedure is entirely illogical, as the arterial supply to these intrathoracic extensions comes from the superior and inferior thyroid arteries which arise in the neck, and should therefore logically be controlled in the neck before the extension is removed. They cannot be ligated from a thoracic approach at an early stage of the operation. Once these vessels are controlled, the delivery of the thoracic extension by the careful insertion of a forefinger in the right plane can cause no damage. I have only once had to divide the sternum, in a case in which the thoracic extension had become calcified *in situ* and could not be removed through the thoracic inlet.

Malignant Goitre.

Malignant goitre could form the subject of a paper by itself, but briefly it occurs in three main clinical forms: (i) single-nodule carcinoma; (ii) diffuse carcinoma; (iii) so-called "aberrant thyroid".

The treatment of the first group has already been discussed, and the only way of being certain is to remove all single lumps and have them examined microscopically.

The second group, that of diffuse carcinoma, is usually clinically typical because of stony hardness and infiltration with enlarged lymph glands; but early Hashimoto goitre or calcified hard nodules in nodular glands may give rise to pre-operative doubt, and may require exploration and examination of frozen sections. If early malignant disease is found, it is removed by total thyroidectomy and block dissection before infiltration into surrounding structures has occurred, and the prognosis is reasonably good. However, if the gland is infiltrating surrounding structures and lymph glands are involved, a total thyroidectomy and bilateral gland dissection should be performed to relieve pressure. This should be followed by radiotherapy, as some are very slow-growing tumours and quite radiosensitive, and the patients may live for many years. Radioactive iodine has been a disappointment, owing to the fact that the carcinoma cells do not take up the iodine.

A patient with an "aberrant thyroid" should always be operated on by removal of the involved side and ipsilateral glands. This treatment will produce a high percentage of cures.

A Hashimoto gland requires only exploration and examination of sections, to confirm the diagnosis, and to relieve any tracheal narrowing from the fibrosis by removal of the central isthmus; the main gland should not be removed, as myxœdema will be likely to develop subsequently.

Summary.

The surgical treatment of the six clinical types of thyroid disease is as follows.

1. Single adenoma should be treated by adenectomy, for prophylactic and diagnostic reasons.

2. In colloid goitre, subtotal thyroidectomy should be carried out only for cosmetic or pressure reasons.

3. (*a*) Non-toxic nodular goitre, if pre-menopausal, may be treated merely by observation of the patient. If it is menopausal or post-menopausal, or if there is any suspicion of toxicity, subtotal thyroidectomy should be performed. (*b*) Toxic nodular goitre should be treated by subtotal thyroidectomy.

4. In Graves's disease, toxicity should be eliminated by medical means, and the need for operation reassessed.

5. Retrosternal goitre requires removal of the retrosternal mass and nodules.

6. Malignant goitre should be treated by exploration and excision according to the degree of spread.

SOME PSYCHOLOGICAL PATTERNS OF DEAFNESS.[1]

By ERIC SUSMAN,
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The rest is silence.

—*Hamlet*, Act V.

FOR dramatic critics and Shakespearian commentators, down the years, the precise meaning of this last line, spoken by the Prince as he expires, has been a great puzzle. I use it as a text for my discussion on some psychological aspects of deafness because this subject, too, is an enigma. I must say at the outset that the sparse literature on this particular aspect of deafness has been of little help to me in the preparation of the remarks that follow. These are based merely on personal experiences encountered in general medical and neurological consulting practice. If, in addressing this audience of otologists, I fall into the error of preaching to the already converted, I crave your pardon in advance for a waste of precious time in your specialized deliberations.

Man is essentially a creature of the herd. This has been suspected for hundreds of years. The brilliant studies of Wilfred Trotter finally put the herd instinct, and all its implications, on a sound scientific basis. With the sure instincts of the artist, Defoe knew that in order to keep his hero, Robinson Crusoe, from going insane and to avoid bringing his tale to a premature end, he had to invent the Man Friday. I believe that the psychopathology of deafness depends almost entirely on the patients' complete (in the stone deaf) and partial (in the hard of hearing) isolation from the herd. The key word, then, is isolation.

In such scanty writing as exists on my theme, authors are accustomed to start with contrasting the blind with the deaf. This is a valid curtain-raiser to the subject, because the effect of blindness in the individual in so many ways is the antithesis of the effect of deafness. In the rough-and-ready generalizations that follow, please do not conclude that every blind man is saintly, and every deaf man, satanic.

The blind man is clothed in the beautiful garments of sweetness, humility, resignation and courage. The deaf patient is often waspish, arrogant, petulant, and yet timorous. The blind are clubbable, enjoying both each other's society and the company of normal people. The deaf rapidly become lone wolves. They are secretive and introverted. With a few striking and spectacular exceptions, attempts at the formation of a deaf group for social, therapeutic or rehabilitative purposes, so far as I am aware, have always ended in a dismal flop. Many blind people are deeply religious and seek solace for their suffering and their disability in the will of God, like Milton (Sonnet XIX):

> Who best
> Bear his mild yoke, they serve him best . . .
> They also serve who only stand and wait.

And again (Sonnet XXII):

> Yet I argue not
> Against Heaven's hand or will, nor bate a jot
> Of heart or hope, but still bear up and steer
> Right onward . . .

Contrast this majestic Miltonic concept with the attitude of the deaf, who rarely grow beyond their resentment and their fury with their fellow men.

My final contrast between these two sense losses is on the theme of adaptation and adaptability. The blind tend to belittle and discount their disability. This applies especially to cortical blindness, met with in destructive lesions of the occipital lobe and its connexions. They develop the most exquisite, delicate and, often, quite fantastic compensatory mechanisms along the lines of hearing, touch and taste.

In the deaf, the potentialities for compensatory patterns are few indeed. You gentlemen know, better than myself, the obstructionist tactics used by so many deaf people when attempts are made to help them.

It is an old observation that one may make jokes about the deaf in the music hall, in the smoking room and elsewhere. To do so about the blind, in any environment whatsoever, would be a monstrous and unforgivable error in taste. This expresses surely the attitude of the man in the street to the two disabilities.

But we must return to our subject proper. The social medium for man is talk. The deaf become automatically excluded from the everyday stimulus of conversation, which provides the balance, the sense and the gaiety of life. Books make one reflective and philosophical, but conversation brings out a person and forces him to make a contribution. A deaf man is like the one sober man at a drunken party. Everyone else's mannerisms and behaviour become to him hideous and silly. He feels he does not belong. He is not included, and is not wanted. So it is with the deaf man. This stage marks the beginning of the bitterness and distaste for his fellow men. We very soon have to deal with the psychopath whose attitude of mind spills over to contaminate all the normal persons with whom he comes into intimate contact. "If you don't shout at me, you don't love me", is the deaf man's erroneous deduction.

My colleague, W. H. Trethowan, Professor of Psychiatry in the University of Sydney, has drawn my attention to certain paranoid reactions amongst the deaf. He believes that the sufferer assumes that everything he cannot properly hear, he is not meant to hear, and that the conversation is potentially derogatory to him.

This is a shrewd observation, because it is the spoken word that conveys our true feelings. Gestures and facial expression, although important, merely aid and elaborate the spoken word.

Let us concentrate and imagine that we are suddenly excluded from all conversation. Let us get into the mind of our deaf man. Not for him are the parental pleasures of listening to the conversation of his children, the enlarging vocabulary, the comical errors, the general prattle and the nocturnal prayers. Not for him the exchange of thoughts with adolescent and young adult minds, the stimulation of a new generation of ideas and ideals and all that goes with the earnestness, the enthusiasm, the freshness and the hopes of youth. Not for him the intimate whispered conversation of lovers, revealing their true selves to each other.

There is also a grave outfall at higher psychical levels. He misses the excitement of the beat and rhythm of a military band, marching the men to the wars. The emotions aroused by the symphony orchestra, the mass reaction of the hand-clapping when the conductor appears,

[1] Read at a meeting of the Section of Oto-Rhino-Laryngology, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

the intensity of the "sound absence" before the concert begins; all these pleasures pass him by. He cannot possibly capture the feeling of tension and excitement at a theatrical first night, just before the curtain rises. Gone is the sound of urgency in the human voice when danger threatens; gone are the sounds of nervousness, of anger, of wit, of humour, of tenderness, the sound of sincerity or insincerity. How we should miss the crescendo and diminuendo of the human voice! What a humdrum life it would be, but for the *nuances* of speech, the sly digs, the double meanings, the *Wortspiele* that mean so much in an elegant, educated, cultivated society. For the deaf, the whole range of human emotions, normally a beautiful spectrum, becomes a dirty, dull, drab grey.

But there are further milestones to be passed on the long, sad journey towards stone-deafness. Loss of judgement in quite minor matters of life soon appears, and this in turn gives way to loss of confidence. Irresolute, uncertain and fearful, for the deaf the smallest thing, such as giving an order to a taxi-driver, or asking the way in the street, becomes fraught with difficulty and humiliation. "Take me to Sandy Bay" may be whispered or bellowed. He cannot hear the "backwash" in his own ears.

The deaf man finally refuses to do these things, and then begins the stage of withdrawal. He disappears into his own world of phantasy. Evidence of "bloody-mindedness" now makes itself apparent. Prompted by some revenge motive, he pretends not to hear, or to hear only what suits him. The late William Morris Hughes, so it is related, was a past master at this conscious capacity for not hearing. In an argument, your deaf man succeeds in having the last word, because there is no further stimulus for normal people to prolong the agony. He gets a perverted satisfaction from this verbal victory.

At this stage, also, the acute observer will notice a curious dated pattern of speech and vocabulary. Not being *au fait* with contemporary and fashionable adjectives, or with the ever-changing idioms of colloquial speech ("I couldn't care less!"; "Isn't it scrumptious?"; "That was a wizard dance"; "Elvis the Pelvis"; or that elegant love gambit, "Hi, there, gorgeous!"), the deaf man sounds archaic, old-worldly and pontifical in his utterances. When he uses slang, it is the Air Force jargon or the golf club lingo of past decades. His associations are fixed, and fixed irrevocably, to the time when he lost his hearing. If and when he whistles, and presuming he was a man of my own vintage, you would hear "Waiting at the Church", "The Sympathy Waltz" or "Yip-i-addy-i-ay".

And so we reach the stage of stone-deafness. To many people, after the years of strife and struggle, this comes as a blessed relief. With Antony (*Antony and Cleopatra*, Act IV) they readily, almost eagerly, admit defeat:

> Unarm, Eros. The long day's task is done
> And we must sleep.

And later in the play (Act V) there is an echo of the release motive when her lady-in-waiting says to Cleopatra:

> Finish, good lady; the bright day is done
> And we are for the dark.

The tumult, the torment, the torture are at an end.

Conclusion.

Before this meeting of specialists I would not wish to assume the rôle of a presumptuous or impertinent busybody, but may I conclude with a note on the management of deafness? Most of you are familiar with the first great general principle of rehabilitation. We doctors are not greatly concerned with what our patients cannot do; but we are intensely interested in what they can do. I hope that you will agree with me that the rehabilitation of the deaf has been a woefully neglected subject. I believe that a great deal can be done to stop, or to slow down, the psychopathological descent and deterioration that I have tried to describe. The management of the deaf should be conducted, not from the psychiatrist's sofa, but in the otologist's consulting room. It is for the specialist himself, endowed with all the prestige and reputation of the expert, to deal with the associated psychological difficulties of the deaf. He must cajole or bully his patient into using a hearing-aid—not always an easy task. He himself must supervise the teaching of his patient in the use of the instrument to the best advantage. By repeated suggestion and sympathetic encouragement, he must persuade his patient to persevere in his lip-reading lessons. The constant use of the pad and pencil must be enforced. By explanation and by wise counsel, he must deal with the exasperation and despair so often exhibited by the members of his patient's entourage. The deaf patient should visit his specialist consultant more frequently than is now the case. You will not help everybody. Just as some patients fall in love with their peptic ulcer, or their asthma, or their migraine, so you find that the occasional deaf man is positively infatuated with his disability.

I believe that we can do much more for the deaf than we are doing today. The problems associated with deafness are a great challenge to the medical profession in general, and to otologists in particular. With a more zealous and more thorough approach, the results should be very rewarding and very heart-warming.

Mr. President, "The rest is silence".

SERUM PEPSINOGEN LEVELS: RELATION TO GASTRIC SECRETION AND GASTRIC BIOPSY.

By K. E. NOLAN.[1]

From the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research, and the Royal Melbourne Hospital, Melbourne.

DURING the past few years, physicians and biochemists have endeavoured to replace the traditional fractional test meal with more pleasant and more easily performed substitutes. This resulted in the development of the tubeless test meal with the use of ion exchange resins (Bolt *et alii*, 1957), and the estimation of uropepsin levels (Segal *et alii*, 1957). Recently a method for estimating blood pepsinogen levels has been described, and it is the purpose of this paper to examine this gastric function test in relation to gastric secretion, clinical findings and the histological appearance of the mucosa of the body of the stomach as shown by gastric biopsy.

Mirsky *et alii* (1952) described the method for estimating the blood pepsinogen level, and confirmed the concept that the peptic cells of the stomach have both exocrine and endocrine functions. Pepsinogen is a proteolytic enzyme in plasma or serum, which is optimally activated at pH 1·5 with an autocatalytic conversion to pepsin, but is inactivated by alkalinization. It is related to the levels of activity of the pepsin-secreting cells of the gastric mucosa, and is the precursor of the urinary enzyme uropepsin.

The laboratory estimation is a comparatively simple procedure, and the venepuncture does not inconvenience the patient. The individual values are fairly constant from day to day, and the laboratory analysis is quite reproducible. The inherent errors found in uropepsin analyses, due to variations in renal clearance and interfering chromogenic substances, are avoided.

Method of Estimating Serum Pepsinogen Content.

Mirsky's modification of Ansen's method of estimating tyrosine-like substances due to enzymatic proteolysis was used. Other investigators have employed a spectrophotometer at a wave-length of 420mμ, but a Hilger absorptiometer, as found in most clinical laboratories, proved quite satisfactory at 430mμ.

Aliquots of a standard serum (value 502 ± 26 tyrosine units) were stored in a deep-freeze until use, and by the inclusion of these sera in nine different assays, the

[1] Working with the aid of a grant from the National Health and Medical Research Council of Australia.

percentage variation present in the procedure was found to be 6·3, compared with a variation of 4% in the spectrophotometric method as reported by Hoar and Browning (1956).

A series of standard solutions of tyrosine were included in each assay, as the Folin-Ciocalteau colour reaction is not constant. Results are expressed in tyrosine units, equivalent to microgrammes of tyrosine released per millilitre of serum.

Results and Discussion.

Control Group.

Normal subjects, free from gastro-intestinal and renal disturbances, were selected from both sexes over a wide age range. The mean value was found to be 597 T.U. (tyrosine units) with a standard deviation of ± 104 T.U., a value conforming to the results of Mirsky *et alii* (1952), and slightly higher than that reported by Hoar and Browning (1956) of 486 ± 163 T.U. Fractional histamine test meal examinations were also performed on some members of this group, to establish free acid levels.

Pernicious Anæmia.

This group was composed of patients in whom the typical hæmatological changes and achlorhydria had been demonstrated. The levels were very low, and are thought to be mainly non-specific, the result of the hydrochloric acid, used in the technique, splitting the plasma proteins. The mean value was found to be 240 T.U. with a standard deviation of ± 36 T.U. Values obtained from patients after subtotal gastrectomy fell into the same range.

Atrophic Gastritis.

This group was selected on the basis of histological examination of gastric biopsy material and the demonstration of achlorhydria. Many of the patients suffered from chronic flatulent dyspepsia, and X-ray examination revealed neither ulcer nor cancer. Funder and Weiden (1952) examined the correlation between test-meal findings and the gastric histological picture and showed the increasing depression of acid secretion correlated with histological changes from superficial gastritis through atrophic gastritis to gastric atrophy. In the present study the serum pepsinogen values in the atrophic gastritis group gave a scatter of values (mean 763 T.U.), not related to the histological classification of severity of gastritis, with no significant difference between superficial and atrophic gastritis values, although in the group of cases defined as "gastric atrophy" the levels were in the lower ranges.

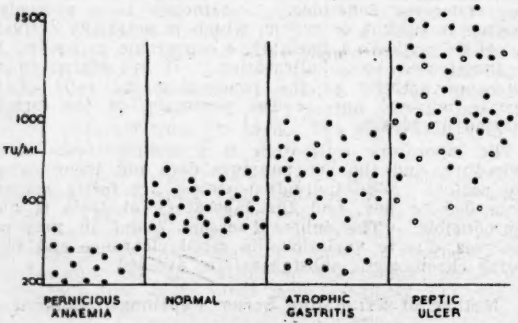

FIGURE I.

Serum pepsinogen levels in normal subjects and in pathological conditions: atrophic gastritis group, "o" = gastric atrophy; peptic ulcer group, "o" = gastric ulcer, "●" = duodenal ulcer.

Peptic Ulcer.

Evidence of a gastric or duodenal ulcer was obtained by X-ray examination, by gastroscopy or at operation. There was considerable overlapping in the results obtained from patients with gastric or duodenal ulcer, although, as has been reported by other investigators, the mean values for these two groups are higher than normal. Moreover, it is of considerable interest that the mean of the duodenal ulcer group (1150 T.U.) was greater than that of the gastric ulcer group (967 T.U.).

Pepsinogen values for gastric ulcer tend to fall more within the normal range, while duodenal ulcer values tend to be elevated.

The serum pepsinogen levels from the control group, the pernicious anæmia group, the atrophic gastritis group and the peptic ulcer group are shown in Figure I.

Gastric Carcinoma.

Lowered values have been reported by several authors (mean 388 ± 36 T.U.), but although only a small group of patients was studied in this laboratory, values obtained covered a wide range, from 1632 to 380 T.U. It is thought that this spread may correlate with the early diagnosis of cancer, higher values being obtained before zonal gastritis around the tumour became extensive.

Relation of Pepsinogen Levels to Free Acid Values Obtained by Histamine Test Meal Examination.

Figure II illustrates the comparison obtained between serum pepsinogen level and test meal findings. Both the pernicious anæmia and the atrophic gastritis groups show histamine-refractory achlorhydria, but serum pepsinogen levels are markedly different. In gastritis the depression

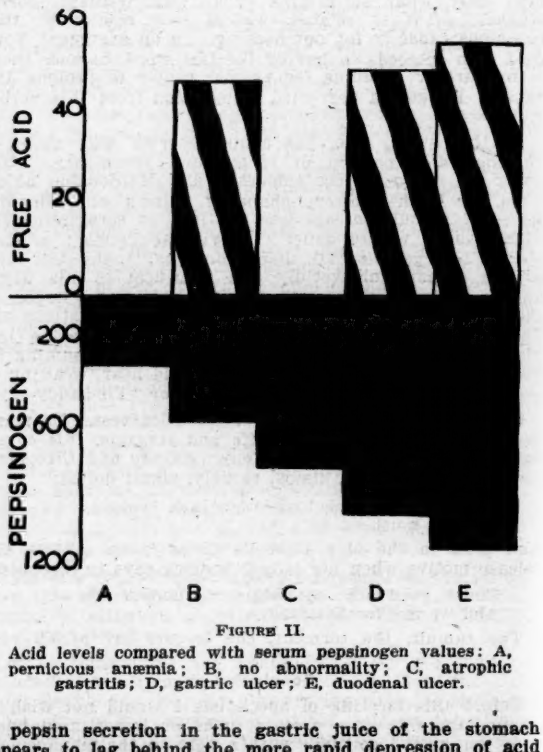

FIGURE II.

Acid levels compared with serum pepsinogen values: A, pernicious anæmia; B, no abnormality; C, atrophic gastritis; D, gastric ulcer; E, duodenal ulcer.

of pepsin secretion in the gastric juice of the stomach appears to lag behind the more rapid depression of acid secretion, reaching a non-significant value in gastric atrophy (Wood *et alii*, 1949; Funder and Weiden, 1952). However, the slight increase of blood pepsinogen levels above the normal in superficial and atrophic gastritis may be due to a change in the secretion gradient of pepsinogen into the blood-stream as a result of changes in the gastric mucosa. Levels in those cases defined histologically as gastric atrophy, except for one case, were very low.

The difference in acid levels found in duodenal and gastric ulcer patients was mirrored by the difference in serum pepsinogen levels.

In three cases of hæmorrhage from œsophageal varices, the pepsinogen value obtained was in the higher range of normal, and when a test meal examination is contra-indicated, an estimation of blood pepsinogen level may be a useful and prompt aid in diagnosis.

Effects of Steroids on Pepsinogen Level.

Figure III summarizes a study of a patient with severe rheumatoid arthritis receiving steroids in very high dosage for intractable pain.

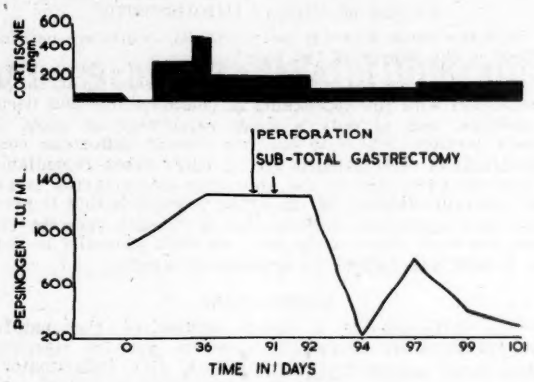

FIGURE III.

Serum pepsinogen level against steroid dosage in case study.

A rise of value from 909 to 1295 T.U. was noted with the appearance of steroid-induced ulcers. This agrees with the findings of Hirschowitz *et alii* (1957), who showed that ACTH increased the renal clearance of pepsinogen, to increase the uropepsin value, while blood values remained fairly normal. They also noted a greatly increased pepsinogen level on the appearance of a steroid-induced ulcer, although the value was normal before the ulcer appeared (Hirschowitz *et alii*, 1956).

Conclusion.

In conclusion, it may be stated that the estimation of the serum pepsinogen level has proved to be useful in the study of gastric function and in the evaluation and management of the patient with gastro-intestinal symptoms.

Summary.

1. Serum pepsinogen levels were studied in patients with gastric dysfunction. The values obtained were grouped according to the histological findings in the gastric mucosa, as shown by gastric biopsy material, and related to the free hydrochloric acid values found by histamine test meal examination.

2. The chief value of this estimation appears to be in the differentiation of macrocytic anæmias when histamine-fast achlorhydria is present, and in establishing the diagnosis of pernicious anæmia, particularly in early stages, when clinical findings may be inconclusive.

3. The serum pepsinogen level is of use in diagnosing peptic ulcer particularly if the result is high, as both in this study and in other larger series reported, the levels in duodenal ulcer tend to fall in the higher ranges. The results from the small group of patients studied who were suffering from gastric carcinoma did not confirm the report that serum pepsinogen values are low in this condition. It is thought that levels may vary in gastric carcinoma, depending on the date of diagnosis and the extent of associated gastritis.

4. Values obtained in cases of atrophic gastritis revealed that some pepsinogen cells were still secreting, causing serum pepsinogen levels that were comparatively high. As pepsin values in the gastric juice have been shown to be lowered in superficial and atrophic gastritis, a change in the secretion gradient may have occurred.

5. In a single patient receiving steroids in very high dosage, a pronounced rise of serum pepsinogen level occurred with the appearance of peptic ulceration. Routine checks in such cases may be of value in the assessment of the effects of steroids; they may indicate the wisdom of introducing an alternative regimen.

Acknowledgements.

My thanks are due to Dr. Ian Wood and Dr. Sara Weiden for advice and encouragement, and to Dr. Leon Taft, who carried out the histological investigations.

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Addendum.

Since this paper was submitted for publication, Poliner and Spiro (1958—*Gastroenterology*, 34: 106) have reported similarly increased blood pepsinogen levels in cases of superficial gastritis with achlorhydria and minimal gastric pepsin secretion, and have attributed this to a "functional blockade of the gastric gland neck".

THE NATURE AND TREATMENT OF OSTEOARTHRITIS.[1]

By C. H. HEMBROW,
Melbourne.

THE subject of osteoarthritis is one which becomes more important with the increasing longevity of modern times. We should all be interested in this condition, for we all have osteoarthritis. I wish to put forward the following views: (i) Osteoarthritis should not be regarded as a disease, but as a state. (ii) Osteoarthritis itself is painless. The symptoms are produced by complications. These are frequently remediable.

OSTEOARTHRITIS IS A STATE OR PROCESS OF AGING.

Each day, hundreds of patients consult their doctor about a painful joint. X-ray examinations are made and conscientious reports describe the presence, perhaps in a minor degree, of certain abnormalities, which are regarded as indicating osteoarthritis. To many, the X-ray findings form a welcome explanation of the symptoms, and the patient is informed that he has osteoarthritis and advised that the condition is not curable and may grow worse and that some forms of treatment may give him relief.

[1] Read at a meeting of the Section of Orthopædics, Australasian Medical Congress (B.M.A.), Tenth Session, Hobart, March 1 to 7, 1958.

The patient is filled with anxiety; he may leave his doctor with a psychological trauma, and perhaps having little or nothing done to help him. He recollects those of his friends who, smitten with rheumatoid arthritis, have become permanent cripples, and feels that he has the early stages of this progressive and incurable disease.

It is not the patient, but his X-ray picture, who is being treated. The assumption that, since the patient has a painful joint and the X-ray film shows evidence of osteoarthritis, then the pain must be due to this condition, gives rise to the pessimistic view that osteoarthritis is an incurable disease, and that treatment, other than symptomatic relief by drugs, is of no avail.

The textbooks include osteoarthritis as a disease among the other diseases of joints; but osteoarthritis should not be regarded as a disease, but as a state or process, the natural process of aging of joints.

Throughout all Nature, in the animal and plant world, we see miracles of growth and development to maturity; but when maturity is reached, immediately decline begins—so it is with joints. However, old age is not a stage that is reached on a certain day or at a definite given age. Aging is a continuous process, as yet not fully understood, beginning to become morphologically and biochemically visible at maturity, but probably existing before it, and resulting in a gradual failure of function. Different parts of the body show the visible effects of aging at different times.

The eye begins to decline at 15 years and capacity to accommodate is lost by 60. Hearing declines in the early forties, and athletic prowess, a combination of physical and mental efficiency, diminishes gradually after 21 years. Mental efficiency declines similarly. Owing to increasing experience and skill with age, the loss of efficiency due to age is sometimes not immediately evident, but can be shown up by increased speed or special strain.

Aging of Joints.

Joints are lubricated, not only by the presence of synovial fluid, but by a unique process. During movement the surface cells of the articular cartilage are themselves shaved away and a new set replaces them. The process is, of course, a gradual one. The joints thus wear with movement, but repair is continuous. As one grows older, the process of repair slows down, and eventually the joint fails to maintain itself. The altering relationship of wear to repair results in damage to the articular cartilage, that wonderful material which is the essential part of a joint. The greatest value of an X-ray film is what it tells us of the state of the articular cartilage, by showing the width of the joint space. While the articular cartilage is present, there is hope of some function though the other structures of the joint are badly damaged; but without it the possibility of joint function is lost completely, even if the other components are normal.

The signs of increase in wear in relation to repair in joints can be observed at early ages, at operation, or by microscopic examination of articular cartilage.

In youth, the articular cartilage is thick, bluish-white and glossy; with increasing age, it becomes thin, yellowish and fibrillated. Decline may start before the age of 20 years, and in the twenties and the thirties there is steady progress. This is variable, but in some persons it proceeds at a greater rate than in others. On microscopic examination, in subjects aged between 20 and 30 years, the degenerative process appears as lines of fibrosis, and in the majority of persons, at the age of 60, the fibrillation of the articular cartilage in the central articular area is visible to the naked eye.

The Process of Osteoarthritis is Painless.

The essential changes in osteoarthritis are painless, as are the similar changes in other bodily functions—sight, hearing, physical capacity, etc. Many people submitted to X-ray examination show radiological evidence of unsuspected and advanced osteoarthritis. There are osteophytes, changes in the adjacent bone and, most important of all, loss of joint space. These X-ray changes have taken many years (at least 10) to appear, but the patient has not noticed pain or other symptoms during that time.

In the case of children, trauma may have resulted in severe damage to the joint, with changes amounting even to eburnation of the central point, and the complaint will be not of pain, but only limitation of range.

Causes of Pain in Osteoarthritis.

In many cases, however, osteoarthritic joints are painful. What is the source of the pain?

The pain does not arise from the process itself, but is associated with the appearance of complications and tissue reactions, and in only a small percentage of cases do these develop. While no one can prevent aging, the complications of osteoarthritis are, in many cases, remediable. Thus the advantage of the view that osteoarthritis is not an incurable disease, but an aging process, is that it gives the more optimistic outlook that if in each case we can find the exact cause of the pain, we shall generally be able to benefit our patient by suitable treatment.

Complications.

The following is a brief outline of the painful complications of osteoarthritis, which may be classified into three groups: (i) mechanical, (ii) inflammatory, (iii) due to changes in the adjacent bone. A careful history is of the utmost importance in determining the cause of the pain, and since the function of a joint is mechanical, observation of the response of the symptoms to rest and to movement is most helpful in this direction.

Mechanical Failure.

Examples of mechanical failure are seizing due to an irregular articular surface, the mechanical effects of osteophytes, nipping of villi and fringes, formation of loose bodies, limitation of range by adhesions. The symptoms in these cases are usually sudden in onset, and they are produced by activity and are relieved by rest. The pain is due to local pressure, or to stretching of fibrous tissue, adhesions or normal ligaments. A succession of acute sprains may ensue, causing incapacity for varying periods, and gradually the joint passes into a state of chronic inflammation. Removal of the mechanical factor will relieve the pain if it is the cause of the patient's complaint, whether other changes are present or not. Thus many patients can be relieved by manipulation or operation.

Chronic Inflammation.

The symptoms of chronic inflammation are worst on rising in the morning, and the joint feels stiff and sore. Activity improves, and the joint may even move freely; but the pain returns as the day goes on, in the form of an ache which persists for an hour or so after the patient has retired to bed. These symptoms suggest the effects of periarticular œdema accompanying the inflammatory state. During rest, œdema fluid accumulates in the periarticular areolar tissues of the joint, and the first movements in the morning are subject to mechanical interference. With activity, the œdema lessens, but the tension of the inflammatory congestion increases and produces aching, which does not subside immediately with rest, for inflammatory changes require time. The nature of the inflammatory reaction is the same, whatever the cause from which it is evoked.

Chronic inflammation in joints results from three causes—chronic trauma, infection and toxæmia.

Chronic Trauma.—As the bone ends alter in shape, the capsule and ligaments begin to suffer abnormal stresses and strains. There follow a series of minor injuries and repeated attacks of periarticular traumatic effusion, with the production of adhesions limiting range, and further irritation until the inflammatory reaction becomes constant.

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CHRISTMAS AND THE PHYSICIAN LUKE.

CHRISTMAS, although it is a specifically Christian festival, exerts a wide appeal, and is honoured by men and women of many faiths and many points of view. It is, as Charles Dickens says through the mouth of Scrooge's nephew, "apart from the veneration due to its sacred name and origin, . . . a good time: a kind, forgiving, charitable, pleasant time: the only time . . . in the long calendar of the years, when men and women seem by one consent to open their shut-up hearts freely, and to think of people below them, as if they really were fellow passengers to the grave, and not another race of creatures bound on other journeys". For a moment we pause and listen, a little wistfully, to the message of voices from outside our torn and tangled world: "Glory to God in the highest, and on earth peace, goodwill towards men."

For these words, that are at once a solace and a stimulus, and for much else that gives its deep meaning to Christmas, we must thank a member of our own profession, the Greek physician Luke, who set down in order the story of the life of Jesus and the activities of the early Christians as he had them from inquiry or first-hand knowledge. This Luke is generally accepted to have been the "beloved physician" referred to in a number of the letters of Paul the Apostle. Probably also he was Paul's personal companion in his hazardous travels around the Mediterranean, and during his imprisonment in Rome. He is thought to have been a Greek of Asia Minor, perhaps of Antioch, and it would not be out of character to assume that he received his medical training in the Hippocratic tradition. That tradition, which had arisen around the legendary figure of Hippocrates in the Greek island of Cos in the fourth century before Christ, and continued in some measure through to the time of Galen in the second century of the present era, undoubtedly attained a standard in method and practice unequalled in the history of medicine until modern times. One important thing on which it laid great emphasis was careful observation and recording of the facts observed. Adherence to this practice was the explicit policy of Luke, stated at the beginning of his record of the life of Jesus, and it is interesting to see it worked out. As a historian Luke has been commended for his accuracy by modern critics, and medical readers will note his interest in the detail of the healing activity of Jesus, of which he records an exceptional number of instances. Other aspects of his writings are not only consistent with but worthy of a medically trained outlook. They betray especially a sense of compassion and respect for human personality. To Luke alone we owe the record of the parables of the Good Samaritan and of the Prodigal Son, classical expressions of practical compassion and of an understanding heart. In an age in which women were of little account, Luke gives to women a full place as people who mattered, and he was obviously interested in children; as a good doctor should be, he was no respecter of persons. On the question of the medical language used by Luke, scholars differ. An exhaustive study was made towards the end of the last century by W. K. Hobart, who analysed the Greek text of Luke's writings, comparing them with contemporary Greek medical texts. It seems likely that he overstated his case, and that many of the words that he regarded as specifically medical were in general use amongst educated men. Nevertheless, he amassed much interesting information, and his findings cannot be wholly dismissed. Probably the very least that can be said is that the language used by Luke is consistent with his being a physician. Two intriguing examples are all that we have time for here. When Luke records the saying about a camel going through the eye of a needle he uses the medical word for a surgical needle; Matthew and Mark use a more everyday word. Another example may be given in the words of the late D. M. Blair, who was a few years ago Professor of Anatomy in the University of Glasgow: "The vivid, seaman-like account (in our translation) of the shipwreck near the end of Acts is due not to the use in the original of nautical terms, of which Luke seems to have been ignorant, but to his apt employment of medical terms of still more expressive meaning, as when he speaks of 'helps' for 'undergirding' the ship and uses two words much more likely to be found in a Greek text book of Anatomy than in a treatise on Seamanship!" Slightly amusing but not surprising is Luke's loyalty to his colleagues over the case of the woman who had had an issue of blood for twelve years. Mark is critical: she "had suffered many things of many physicians, and had spent all that she had, and was nothing bettered, but rather grew worse". Luke sees the doctor's point of view: she "had spent all her living upon physicians, neither could be healed of any".

In his account of the Nativity, we become aware of Luke's great literary gifts, the delicate sureness of touch and the felicity of expression which moved Renan to describe his gospel as the most beautiful book in the world. It does not concern us here whether the details of the story are to be regarded as history, legend or a mixture of the two. The purport is much the same in any case. The striking thing is the way in which Luke, combining the mind of the poet with the skill of the careful recorder, weaves into the simple narrative a series of poems, the Magnificat, the Benedictus, the Gloria in Excelsis, the Nunc Dimittis, which rank with the great religious poems of all times. According to an ancient tradition, Luke learned the details of the birth of Jesus and the surrounding events from Mary herself. Certainly, as he appears to us from his writings, the Greek physician was just such a one as she would confide in and tell the things

she had kept and pondered in her heart. Setting them down with sure artistry, Luke has contributed much to the meaning of Christmas, season of joy and good will. May all our readers find it so!

Current Comment.

NUTRITION AND DENTAL CARE.

PROBABLY because the care of the teeth is the province of an allied but quite separate profession, medical practitioners sometimes pay less attention than they might to a patient's dental state in assessing his general condition. This may even have been aggravated by a degree of reaction from the exaggerated emphasis on dental sepsis which was the fashion several decades ago. However, it is only common sense to consider a patient's teeth in assessing his nutritional state. This has been the subject of a study by S. I. Silverman and J. S. Tobis.[1] The clinical material for the study consisted of chronically ill patients at the Bird S. Coler Hospital, New York City. The object was to provide basic material for a research project on nutritional habits of the chronically ill and their relation to physical medicine and rehabilitation procedures. The findings were grouped under the following headings: (i) effect of masticatory efficiency; (ii) effect of social customs; (iii) effect of hospital regimen; (iv) effect of related medical conditions. Silverman and Tobis conclude that in this hospital, in other institutions and in the home, chronically ill patients have a high incidence of dental disability. The quantity and selection of food taken by them are conditioned unfavourably by their reduced masticatory efficiency. The ingested diet is also conditioned by the social dietary history of patients, the grouping of patients at mealtime, the frequency of mealtime, and the availability and character of supplementary meals. Obesity, inanition and the ingestion of soft diets have a high correlation with the incidence of dental disease and masticatory disability.

These are fairly obvious findings, but all the more likely on that account to be overlooked, especially in their implications. As a result of these preliminary studies, it is suggested that comprehensive dental care, when judiciously integrated into the scheme of rehabilitation, can considerably broaden the base of supportive therapy, not only by implementing nutritional treatment of patients, but also by contributing to their speech capacity, to their general æsthetic appearance, and consequently to their psychological adjustment to their disability. Since, according to the Commission on Chronic Illness, there is considerable evidence indicating that malnutrition plays an important part in the development and course of chronic diseases, it is further suggested that the specialty of physical medicine and rehabilitation should direct its attention to "providing and investigating optimal nutritional support" for the patients under its supervision. This means, in part at least, to see to their teeth.

INTRAARTICULAR THERAPY FOR RHEUMATOID ARTHRITIS.

THE difficulty of assessing the value of a new therapeutic procedure is well demonstrated by the varying results which have been reported from the intraarticular injection of hydrocortisone and hydrocortisone derivatives for rheumatoid arthritis. It is generally considered that the treatment gives subjective benefit, but the effect is usually transient. It has been claimed that hydrocortisone tertiary butyl acetate (T.B.A.) gives greater benefit than hydrocortisone, but this has been denied. G. N. Chandler, V. Wright and S. J. Hartfall[1] have carried out a very detailed study of 24 patients who were suffering from rheumatoid arthritis mainly in the knees, using the complete double-blind crossover method. Hydrocortisone, hydrocortisone T.B.A. and a placebo were each given as four fortnightly injections with eight weeks' rest between treatments. Improvement from treatment was measured by fortnightly assessments of pain, tenderness, walking time, range of movement and limitation of extension. Both drugs showed a significant advantage over placebos in all tests. Except in the case of joint tenderness, hydrocortisone T.B.A. gave greater improvement which was of longer duration than that from hydrocortisone, but the difference between the effects of the two drugs was not statistically significant in any instance. In other words, the apparent greater improvement from injections of hydrocortisone T.B.A. may be due to chance.

During the course of this investigation two of the investigators, G. N. Chandler and V. Wright,[2] made a very disturbing discovery. Despite the generally good clinical response to injections of hydrocortisone and hydrocortisone T.B.A., radiological deterioration, sometimes considerable, had occurred in the knees of over half the patients so treated. There was no significant difference in the amount of improvement in relation to pain and range of movement between the patients in whom radiological deterioration occurred and those in whom no such change was observed.

The implications from this study are definite. Intrasynovial injections of hydrocortisone and related compounds either failed to halt or, more usually, accelerated pathological changes despite the clinical relief usually shown. In other words, such treatment is potentially dangerous. The authors report the production of a virtual Charcot's arthropathy in an osteoarthritic hip joint treated over an eighteen-month period by monthly injections of hydrocortisone. The patient had obtained almost complete relief from pain when treatment was discontinued. If this method of treating osteoarthritis is to continue to be used, and it may well be, because of the clinical relief it may give, strict radiological supervision is essential. It is probable that the chief cause of radiological progression was the encouragement of a damaging level of performance by interference with a normal, locally protective mechanism.

COLD ADAPTATION IN AUSTRALIAN ABORIGINES.

IT has long been known that the Australian aborigines could live entirely naked even in the coldest parts of Australia under conditions which white men could not endure. In winter the night temperatures often fell below freezing point, and camp fires and wind breaks provided the only protection against the cold. Hicks and his collaborators, over a number of years, studied the body temperature and metabolism of natives lying on the ground between camp fires and sheltered by bush wind breaks. The measurements were made in the daytime when the temperatures rose rapidly. Among other things they found that the natives would lie motionless with colder skin temperatures than is customary with the white man, and without shivering or increased heat production. A team of workers, P. F. Scholander *et alii*,[3] from Norway, United States, Canada and Australia, working on the principle that it can be fairly stated that men and animals are fully adapted to their thermal environment only provided they can rest and sleep in it, have studied five whites and six natives during the cold nights. The whites were, of course, the team of investigators. The natives were young males of the Pitjandjara tribe, of arid, semi-desert country in Central Australia. To determine the body temperature, thermocouples were taped onto various parts of the body and read at regular intervals through the night. The subjects breathed air through a hood over the head into a

[1] *Arch. Phys. Med.*, September, 1958.

[1] *Lancet*, 1958, 2: 659 (September 27).
[2] *Lancet*, 1958, 2: 661 (September 27).
[3] *J. Appl. Physiol.*, 1958, 13: 211 (September).

spirometer. They lay nude between fires in the native way, and the natives arranged the wind break and fires according to their usual manner. In some experiments the subjects were placed in thin blanket sleeping bags and had no fires. Natives sleeping "proper bush" often had skin temperatures in the shadows as low as 12°-15° C. and, facing the fire, sometimes exceeding 45° C. Such temperatures are painful to white men. When in the blanket sleeping bags with no fire, the white subjects showed an erratic elevation of the nightly metabolism, often to twice the basal figure, due to restlessness and shivering. Very little sleep was enjoyed. The natives lay motionless all night with little or no elevation of the metabolism. Shivering was seen as a rule only when the natives woke in the morning. Towards morning the feet of the white subjects became distressingly cold (15°-17° C.), while the natives with feet temperatures of 12°-15° C. did not seem to suffer any discomfort.

These investigations showed that the aborigines overcame the stress of their physiological environment partly through technological know-how and partly through physiological means. In calm weather the fires seem to provide adequate protection against cold for both white men and aborigines, but the physiological capabilities of the aborigines are called into play during wet or windy weather. The aborigines showed a stoic indifference to pain, and one cannot say how much of their cold adaptation is merely a greater psychological tolerance of discomfort. The bag tests show, however, that there are great physiological differences between white man and aboriginal. The white man shows gross activity, shivering and peripheral cooling incompatible with sleep, while the aboriginal tolerates peripheral cooling without elevating his metabolism during the night.

A study of the adjustment to cold of the bushmen of the Kalahari Desert by C. H. Wyndham and J. F. Morrison[1] shows that the bushmen do not react to cold in the way the Australian aborigines do. The bushman makes better use of fires and shelters, and creates, during the coldest part of the day, a microclimate which is near the thermoneutral zone, so that his adaptation to cold is an intellectual and not a physiological one.

ORAL MEDICATION IN SUN-TANNING.

THE problems associated with sun-tanning are ever present, especially in countries like Australia, where a large section of the population spends much of its spare time out of doors, and where those whose work keeps them in the open air are exposed to strong sunlight. The Committee on Cosmetics of the American Medical Association has concerned itself with the subject for some time, up to the present chiefly with the object of working out a regimen that would minimize the effects of the sun on the skin by moderate exposure and topically applied preventives. The introduction of a drug for oral administration opened up a possible new avenue, and the Committee presents a report on its investigations along these lines.[2] The drug in question is methoxsalen ("Meloxine", "Oxsoralen"), also referred to as 8-methoxypsoralen or 8-MOP. It is a pigment-stimulating agent derived from the plant *Ammi majus* Linn., which the natives of ancient Egypt knew could restore pigment in vitiliginous skin areas. Since 1947, when Fahmy and Abu-Shady isolated the most active agents from extracts of the plant, methoxsalen has been tried in the treatment of vitiligo, with varying degrees of success and with the observation of a number of unpleasant side effects. However, at the present time it offers by far the best treatment for vitiligo.

The idea of using methoxsalen to potentiate sun-tanning and for light protection arose from an observation that savours somewhat of serendipity; a physician's wife, under treatment for vitiligo, observed that ingestion of methoxsalen before exposure to sunlight greatly enhanced the tanning response of her normal-appearing skin. The finding has been confirmed on many occasions, and the drug has been recommended as an aid to sun-tanning. The Committee in its report states that it is now up to the medical profession to decide whether it should endorse the systemic use of the drug solely for light protection and cosmetic tanning in a large section of the population not easily kept under proper observation. The report then proceeds to discuss the present position under the headings of effectiveness of the drug, mechanisms of action, and potential toxic effects.

Referring first to the effectiveness of the drug, the report states that there is some evidence that the skin of many normal persons, as well as the normal skin of vitiliginous persons, develops some increase over the normal hyperpigmentation when it is repeatedly exposed to sunlight within two to four hours after the ingestion of 10 to 20 milligrammes of methoxsalen. Further, some sun-sensitive persons, including albinos, found that their skin acquired increased tolerance to sunlight while they were taking methoxsalen. However, determination of the dosages of the drug and of sunlight involves a delicate calculation; if either is too large, the result may be the exact opposite of that desired—erythema, œdema, blistering and pain. This is a highly practical consideration.

With regard to the mechanisms of action of methoxsalen, the report summarizes the findings of two investigators, S. W. Becker, junior, and G. Miescher (the latter working on sun protection in general). The first result is the formation of a thickened and compact horny layer—a common reaction to a number of repeated insults to the skin, one being repeated exposure to ultra-violet rays. The natural insensible desquamation of such a thickened and compact horny layer is diminished. Normally, pigment granules ascend in the epidermis and are shed with the desquamating horny lamella; but in the thickened layer this "excretion" of melanin dust is considerably slowed down, so that such skin appears darker. Becker's findings suggest that if there is increased melanin formation under the combined influence of psoralens (of which methoxsalen is one) and sunshine, this is in direct proportion to the amount of inflammation produced. However, increased tanning is the result mainly of retention of melanin. The adherent stratum corneum retains the pigment which reaches it, and a large amount of melanin is also retained in the basal cell layer.

Discussion of the potential toxic effects poses a number of questions. It is held at present that most healthy adults can safely take 10 to 20 milligrammes of methoxsalen daily by mouth for one or two weeks; but there are still many unknowns, and increased dosages of the drug and of sunlight may have untoward systemic effects as well as deleterious effects on the skin. The Committee in this regard, and having considered the results of experimental work in mice, poses the following questions:

> Will the incidence of basal-cell or squamous-cell carcinomas be changed, either decreased or increased? Will other senile skin changes be delayed or accelerated? Will there be any effect on the formation of melanomas? When selected strains of mice are injected peritoneally with given quantities of methoxsalen daily throughout an experimental period, the incidence of carcinomas is increased. Yet, if they receive the drug orally, the incidence of carcinomas is decreased. How will these effects produced in mice compare with those which may be produced in man? Which dose and route of administration may prove to enhance carcinogenesis and which to reduce carcinogenesis in the skin of man?

The Committee points out that, even after a full discussion of the subject by a group of investigators in 1958, and when all the known evidence is taken into account, there are no clear-cut answers to these questions. Doctors must carefully consider the position before they decide to recommend the oral ingestion of methoxsalen either to mitigate burning or to potentiate tanning.

[1] *J. Appl. Physiol.*, 1958, 13: 225 (September).
[2] *J.A.M.A.*, 1958, 167: 2077 (August 23).

Abstracts from Medical Literature.

NEUROLOGY AND PSYCHIATRY.

Gliomata of the Optic Nerves.

H. W. DODGE *et alii* (*Arch. Neurol. & Psychiat.*, June, 1958) discuss gliomata of the optic nerves. In their series of 46 cases there was a marked prevalence of children, and in some of these cases the evidence pointed rather strongly to a congenital origin of the tumour. They discussed the spread of gliomata of the optic nerve and were impressed by their tendency to permeate the substance of the optic nerve, especially in a proximal direction. Distal spread of the tumour with invasion of the globe was in their experience a rare event. In 12 patients who had gliomata of the optic nerve proptosis was the outstanding finding. In the remaining 24 patients who had diffuse or chiasmal type of glioma, bilateral loss of vision was a common presenting feature. This study indicates a good prognosis for unilateral lesions of the optic nerve, with some cures following total removal. The more diffuse tumours which involve the optic chiasma and tracts carry a less favourable prognosis.

Intracranial Arterio-Venous Aneurysms.

O. HÖÖK, L. WERKO AND G. ÖHRBERG (*Arch. Neurol. & Psychiat.*, June, 1958) discuss the effect of intracranial arterio-venous aneurysms on the cardio-vascular system. Their physiological studies provided no basis for assuming that intracranial arterio-venous aneurysms had resulted in shunts of an order to overload the cardio-vascular system. All values for cardiac output, pressure in the pulmonary circulation, and renal clearance tests were within normal limits.

O. HÖÖK AND C. JOHANSON (*Arch. Neurol. & Psychiat.*, July, 1958) discuss intracranial arterio-venous aneurysms, with particular attention to their growth. They studied 12 patients over a period of three to 15 years. Eight of the aneurysms were found to increase in size, and this increase was most pronounced in those situated in and adjacent to the Sylvian fissure. In one of their patiehts thrombosis of the aneurysm occurred.

The Neuropathy of Multiple Myeloma.

M. VICTOR, B. Q. BANKER AND R. D. ADAMS (*J. Neurol., Neurosurg. & Psychiat.*, May, 1958) consider the neuropathy of multiple myeloma. They discuss five patients whose symptomatology was characterized by varying degrees of bone pain, anæmia, osteolytic lesions, hyperglobulinæmia, Bence-Jones proteinuria and the presence of myeloma cells in the marrow. These patients developed a polyneuropathy. Although varying in severity, it took a characteristic form in four of the five patients. It was an asymmetrical, atrophic, areflexic, sensori-motor affection of the legs and arms. This polyneuropathy does not depend on compression of nervous structures by tumour tissue. The protein level of the cerebro-spinal fluid was raised in four of the patients. This neuropathy of multiple myeloma bears a close relationship to that of carcinoma of the type unrelated to direct involvement by neoplasm. The authors emphasize that in a patient with obscure neuropathies a careful search should be made for both carcinoma and multiple myeloma.

Clinical Features of Porencephaly.

R. W. NAEF (*Arch. Neurol. & Psychiat.*, August, 1958) discusses the clinical features of porencephaly. He states that the condition probably results from one of two causes: (i) true clefts formed in the brain as a result of failure of development of the cerebral mantle; (ii) circumscribed defects in the cerebral wall, which arise as a result of destruction of cerebral tissue. The onset of symptoms can be at any age after birth. The initial symptoms are varied. Epileptic seizures are the most common, followed by weakness of a limb. The main symptoms are those of a focal brain lesion. The author found that the symptoms progressed in about 88% of cases. The electroencephalogram indicated focal activity in 16 cases in his series. Air studies revealed the porencephalic defect. The only symptoms that were relieved were the fits, after anticonvulsant treatment. Surgical procedures, comprising incision and drainage of the cyst, were undertaken in two instances. Excision was performed in two cases.

Pelizaeus-Merzbacher Disease.

H. R. TYLER (*Arch. Neurol. & Psychiat.*, August, 1958) discusses Pelizaeus-Merzbacher disease. Of the family studied, 27 members in seven generations were affected in a fairly stereotyped and predictable manner. The disease was always transmitted through an unaffected female, and the affected male never reproduced. About half the females had affected children. The early development of nystagmus and other brain-stem signs distinguishes the illness from familial forms of Schilder's disease. The author states that from reported pathological findings Pelizaeus-Merzbacher disease has many points of resemblance to diffuse sclerosis. It now seems generally accepted that this disease represents a clinical variation or subdivision of diffuse sclerosis. The distinguishing features are the early onset of symptoms, often in the first weeks of life, the exceedingly chronic course of the disease, its heredo-familial nature and the predominance of signs relating to the brain-stem, which occur early.

Allergic and Emotional Factors in Children with Asthma.

R. T. LONG *et alii* (*Am. J. Psychiat.*, April, 1958) attempted to seek an explanation for the common observation that children with intractable asthma are often symptomatically relieved by admission to hospital even though they continued to take the same drugs and in the same dosage. Two possible factors were assessed: house dust and interpersonal tension between the mother and child. Eighteen severe asthmatics between the ages of six and 12 years were admitted to hospital; 13 of these had a "positive" skin sensitivity to house dust. When the children were symptom-free, their rooms were sprayed with dust from their homes in a concentration far exceeding that which would have normally circulated there. In not one case was an asthmatic attack provoked. From this the authors conclude that house dust alone is not a sufficient cause for the production of asthma. The children were then interviewed, and after discharge from hospital were followed up by a child psychiatrist. A social worker assessed the mothers and determined their conflicts in relation to the children, and finally projective testing was carried out and compared with a control group of similarly matched non-psychosomatic children. The asthmatics all had strong regressive dependent wishes, but these were specifically a wish to return to the state of closeness to the mother that existed before birth. This intrauterine closeness was featured by the high incidence of claustral fantasies in the thematic apperception test (in 10 out of 16 patients compared with three of the 15 control subjects). The survey confirmed Alexander's thesis that it is the fear of separation from the mother and not actual separation which bothers asthmatics. The fear of being too close to mother was also commonly found, explaining how separation can act to reduce anxiety.

Recurrent Multiple Cranial Nerve Palsies.

C. SYMONDS (*J. Neurol., Neurosurg. & Psychiat.*, May, 1958) discusses recurrent multiple cranial nerve palsies in four cases, the resemblance between the cases being close enough to suggest that they constitute a recognizable clinical syndrome. There is no definite ætiology, but the possibility of a hypersensitivity reaction as a common factor is suggested. In each case there was a succession of cranial nerve palsies of rapid onset and transient duration, occurring at irregular and sometimes long intervals over a period of several years. The cerebro-spinal fluid in each case was normal.

Studies in Ulcerative Colitis.

G. J. MOHR *et alii* (*Am. J. Psychiat.*, June, 1958) state that they were stimulated to investigate the mothers of children with ulcerative colitis by Gerard's observations that such mothers are narcissistic and uninterested in the child, except as a self-enhancing asset. Their work is based on an intensive study of six childhood cases of ulcerative colitis; particular attention was directed to the parent-child relationship and the nature of the conflict situations related to the illness. All six mothers reacted to their failure to win the love of their own mothers with varying feelings of inadequacy about their own maternal role, and the world was seen as a dangerous place in which one survives only by one's own effort. The pregnancy and period of early care of the child were experienced as damaging to the mother, and the child's illness confirmed her own inadequacy and the undependability of the environment. The father's influence is primarily mediated through the mother, but may be a principal factor in rendering her incapable of meeting the child's needs. The child's response to parental inability to solve problems of living is an effort at

independence, and the over-striving of such children is a life-saving device evoked by fantasied danger of abandonment. Failure in the compensatory effort to assume parental responsibility in the child was associated with augmentation of symptoms and feelings of helplessness.

Follow-up Results in Psychiatric Illness.

D. W. HASTINGS (*Am. J. Psychiat.*, June, 1958) discusses the follow-up of 1638 patients who were admitted to a psychiatric hospital during the years 1938 to 1944. These patients were personally interviewed by the one social worker, and the manner in which they had adjusted socially after leaving hospital was assessed and graded into five clearly defined categories. None of the patients had any form of so-called "organic" therapy while in hospital (electroconvulsive therapy, insulin therapy, neurosurgery, chemical abreactions etc.), and so this group provides, to some extent, basic data which will be of use in assessing the therapeutic value of modern physical therapies. The study emphasizes the gravity of prognosis for patients diagnosed as having schizophrenic reactions; only 29% made a reasonably satisfactory social adjustment. The prognosis for involutional melancholics was not much better (31%), compared with 42% who had achieved a reasonably satisfactory adjustment in the manic-depressive group. The psychoneurotic group were presumably those with a severe degree of illness, having been admitted to a psychiatric hospital, and staff time and length of stay made psychotherapy of an intensive type unlikely. The remission rates in this group are particularly interesting; 46% made a satisfactory social adjustment. More detailed analysis of the findings is presented in five tables.

HYGIENE.

Return to Work After Cardiac Illness.

J. THORPE AND N. WEAVER (*Arch. Indust. Health*, August, 1958) review sickness absenteeism due to cardiovascular diseases in a group of industries involving 600 employees suffering from some cardio-vascular illness. Ætiologically, two-thirds of the absences were due to arterio-sclerotic heart disease, one-fifth to hypertensive disease, and the remainder to rheumatic heart disease and miscellaneous cardio-vascular disabilities Myocardial infarction was the cause of 29% of the absences and coronary insufficiency the cause of 28%. Congestive heart failure was responsible for 14% of absences, uncomplicated hypertensive vascular disease for 15%, and cerebral vascular disease for 8%. The relationship between age and return to work revealed an adverse experience in the 45 to 49 years age group due to the number of myocardial infarction deaths. The decreased number returning to work in the 55 to 65 years age groups represented an increase in the number of retirement cases rather than an increase in mortality. Job classification did not exert a major influence on whether a man returned to work or not. It did influence significantly whether he returned to his previous job in an unrestricted capacity. Only 35% of the wage-earner group did so, compared with 65% of the salaried group. Only 5% of the entire group required reassignment to a new job, practically all of them in the wage group. A follow-up study of the entire group over an average of 18 months (six to 39 months) revealed that 335 remain at work, 159 are living as annuitants (120 having retired for medical reasons), and 106 are dead. The authors believe that selective job placement of the cardiac employee is important from both a medical and a social point of view: medically, because it is a valuable tool in improving physical capacity and reducing psychological invalidism; socially, because it reduces time lost because of disability and enables the individual to continue in productive employment for a longer time with benefit to himself and to society as a whole.

The Dental Hygienist.

M. FALES (*Am. J. Pub. Health*, August, 1958) considers that there is a place for dental hygienists in public health dentistry and that public health dentists can increase their value to the public by using dental hygienists to their fullest capacity in a dental team engaged on dental health work. At the end of a two-year training period a dental hygienist should be able to educate patients and children in dental health, screen patients for treatment of a minor or major nature, take X-ray pictures of teeth, make topical fluoride applications, and take charge of supplies. The author then outlines fields of public health work related to dental health that could be undertaken by a dental hygienist with more experience and training in public health administration and health education. These include tabulation and interpretation of recorded findings and similar statistical analyses, a dental health education programme in schools, education of teachers in dental health, and education of other groups in the community. The author also refers to the part that could be taken by dental hygienists whose families no longer require them full time, either as part or full time officers in a dental health team.

Freezing and Irradiation.

J. NICKERSON, B. PROCTOR AND S. GOLDBLITH (*Am. J. Pub. Health*, August, 1958) discuss the technical developments in the application of freezing and irradiation to food processing. Pathogenic organisms of public health interest that are found most frequently in contaminated food are *Clostridium botulinum*, *Staphylococcus aureus* and species of *Salmonella*. These do not grow in frozen food. *Cl. botulinum* does not produce toxin in acid foods held at temperatures up to 68° F.; in non-acid foods toxin is not produced below 41° F. Botulism has not been reported following consumption of commercially frozen foods. *Staph. aureus* does not grow below 50° F., but freezing does not destroy it or the toxin it produces. Staphylococcal food poisoning has not been reported following the eating of frozen food. Salmonellosis has frequently been reported following the eating of frozen foods, and species of *Salmonella* have been isolated from frozen egg products and poultry. Although all frozen foods, including pre-cooked foods, are subject to contamination before, during and after freezing, and after defrosting, the authors consider they are no more likely to cause food infections and intoxications than other processed foods. A sterilizing radiation dose of 4·5 million rads would be necessary to destroy all forms of *Cl. botulinum*. A pasteurizing dose to destroy most of the *Salmonella* organisms in moist and dry foods would be about one million rads. Data on the dose of radiation to destroy *Staph. aureus* are not available. Sterilizing doses tend to produce off-flavours and loss of natural flavours in all foods except meat, fish and poultry products. Laboratory preservation of milk without undesirable side reactions has given encouraging results. The authors state that there is no evidence that toxicity or induced radio-activity results from treatment of foods with ionizing radiation.

Dietary Proteins.

A. W. FLODIN (*Am. J. Pub. Health*, October, 1958) discusses the problem of insufficient "high efficiency" protein in diets. A "high efficiency protein" is defined as one which gives a relatively high yield of tissue protein as measured by growth or nitrogen retention. The author then refers to the effect of diets deficient in "high efficiency" proteins, firstly as determined experimentally by feeding animals with diets deficient in "high efficiency" protein and secondly by studying human beings living in areas where the average diet is deficient in "high efficiency" protein. Human beings in these areas show, in infancy, subnormal weights at weaning and retarded bone and growth development in childhood. Anorexia, peevishness, apathy, hair changes and pica are common, and the adult size is small. They are also often apathetic, inactive and quiet. Other workers have demonstrated a lowering of resistance to pathogens in addition. The author has shown that in diets in which protein comes mainly from wheat the protein efficiency of the diet can be increased by adding milk and other substances containing good quality proteins. A similar improvement can be obtained by supplementing with lysine. Many dietary surveys and clinical studies have shown that inadequate protein intakes and suboptimum nutritional status occur frequently among important population segments in the United States, including children, pregnant women, adolescents, the aged and the underprivileged. Where protein intakes are low, the diet pattern shows reduced consumption of the high-efficiency animal proteins. Correspondingly, the contribution of protein from wheat and other cereal foods in the diets becomes more important, increasing to as much as 40% to 50% of the total protein intake. In the author's opinion, an increase in the efficiency and quantity of protein in the cereal foods consumed by these individuals would contribute towards improved growth and muscle development in children and, through more abundant labile protein reserves, greater vigour and general well-being in all these population groups.

British Medical Association.

VICTORIAN BRANCH: A STATEMENT.

THE following is published at the request of the Medical Secretary of the Victorian Branch of the British Medical Association.

A Statement.

The Council of the Victorian Branch of the British Medical Association at its meeting on November 26, 1958, had before it for consideration an article entitled "They Want New Faces", which appeared in the Melbourne *Herald* over the name of Mr. B. K. Rank, F.R.C.S., on October 11, 1958.

The Council accepted the position that the article in the form in which it was presented constituted an apparent breach of the Ethical Rules of the Branch; consequently, prior to the meeting an exhaustive inquiry into the circumstances leading up to the publication of the article had been carried out, and, as a result of this inquiry, the following facts emerged:

> The Information Service (Public Relations) Committee of the Council had decided earlier in the year that it was desirable that an authentic statement on plastic surgery should be published in the lay Press in order to counteract certain false impressions which might have arisen in the minds of the public as a result of the publication of an article on "cosmetic" surgery, which appeared in the magazine *The Australian Women's Weekly* on March 12, 1958.
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> In pursuance of the duties delegated to it by the Branch Council, the Information Service Committee decided that the statement might appropriately consist of extracts from the Stirling Lectures delivered in Adelaide by Mr. B. K. Rank.
>
> In order to forestall the possibility that the lay Press might on its own initiative publish extracts from the Stirling Lectures when they appeared in THE MEDICAL JOURNAL OF AUSTRALIA, it was decided to present the authentic statement to the Press before that event; the consent of the Editor of THE MEDICAL JOURNAL OF AUSTRALIA to this arrangement was obtained. At this stage Mr. Rank proceeded overseas in his capacity of Sims Travelling Professor and had no further part in the subsequent events. In accordance with usual procedure, the proposed statement was handed to the Publicity Officer employed by the Branch Council, a journalist, to make the necessary arrangements with the *Herald* for its publication.
>
> It was never the intention of the Committee nor of Mr. Rank that the statement should assume the form in which it subsequently appeared, and the manner of its presentation was decided solely by the *Herald* itself.

In view of these facts, the Council was satisfied that the whole episode was due to an unfortunate combination of unforeseen circumstances, and in particular to what events proved to have been an inadequate liaison between the Information Service Committee and the *Herald*. The Council thereupon resolved:

> That this Council, with full knowledge of the circumstances, considers that no responsibility for the method of publication of the article attaches to Mr. Rank.

H. CECIL COLVILLE, Chairman of Council; C. H. DICKSON, Medical Secretary, British Medical Association (Victorian Branch).

November 28, 1958.

NEW SOUTH WALES BRANCH: PARTNERSHIP IN MEDICAL PRACTICE.

THE following statement has been prepared by the New South Wales Branch of the British Medical Association for the information of those contemplating entering into a partnership for the conduct of medical practice. It has already been circulated as Newsletter No. 6 of the New South Wales Branch, and is reprinted here by courtesy of the Branch.

Although a written agreement is not essential for the establishment of a partnership between two or more persons, it is most strongly recommended that there should be a written agreement in cases where medical practitioners enter into partnership for the conduct of medical practice. The terms of any agreement of partnership for the conduct of medical practice will vary according to the requirements of the parties in each particular case, but it is suggested that the agreement should include or make provision in respect of the following.

1. The full names and addresses of the parties.

2. Recitals as to the facts and circumstances leading up to the establishment of the partnership including the agreement for the sale to the incoming partner of an interest in the goodwill of an established practice (if such is intended) and of the agreement of the parties to carry on practice together in partnership.

3. An assignment to the incoming partner for the agreed consideration of an interest or share in the goodwill of an established practice (if that is part of the arrangement) and as to how the consideration moneys are to be paid and for the payment of interest thereon if interest is to be payable.

4. A statement that the parties have become partners, the date of the commencement of the partnership and the term or period of the partnership. It is not unusual for the partnership to be expressed to be for the joint lives of the partners with provisions in the agreement for retirement after the expiration of a stated period.

5. The names under which the partnership practice will be carried on by the partners.

6. The place or places at and from which the partnership practice will be carried on.

7. The rent or fee payable by the partnership to a partner owning the premises at which the practice is to be carried on for the use by the partnership of such premises or part thereof for the purposes of the practice.

8. The debts owing to an established partner as at the commencement of the partnership and work done prior to such commencement for which accounts have not then been rendered. Is the incoming partner to acquire a share of these and if so for what price and on what terms or are they to remain the property of the partner to whom they are payable. Provision as to appropriation of accounts paid by patients after the commencement of the partnership where the patient owes moneys for services rendered both before and after the date of commencement.

9. Equipment, instruments, plant, furniture etc. of each partner. Are they to become partnership property and, if so, for what price and terms of payment of the price. Otherwise are they to remain the property of the individual partners and is anything to be paid by the partnership for the use of the same.

10. The shares of the partners in goodwill and other partnership assets and in the profits of the partnership.

11. Payment of expenses, outgoings etc., e.g. rents, wages, telephones at surgery and at home, replacement of plant etc., purchase of additional plant etc., drugs, dressings etc.

12. Banking arrangements. Who is to sign cheques.

13. Keeping of clinical records.

14. Keeping of financial records.

15. Yearly, half-yearly or other periodical accounts and balances.

16. Division of profits and periodical drawings on account of profits.

17. Motor-cars of partners and registration, insurance and maintenance thereof. Is this to be a partnership expense or to be the responsibility and at the expense of the respective partners.

18. Gifts to partners by patients, monetary and in kind. Legacies from patients.

19. All to be members of B.M.A. and of Medical Defence Union or to have other agreed insurances against claims for negligence etc.

20. Provisions as to name plates at each surgery or otherwise as agreed and right of access of each partner and his locums to each surgery.

21. Holidays, periods off duty, and leave of absence from practice: (a) Provision for time off, e.g., alternate weekends etc. (b) Annual or other periodical recreation leave. Length of time, when and how to be taken etc. and whether a locum is to be provided and if so at whose expense. Whether recreation leave is to be allowed to accumulate. (c) Extended leave for overseas travel, holidays, post-

graduate study etc. and for local post-graduate study. Length of time, when it may be taken, who has first choice and interval to elapse between return of partner and next person to go. Financial arrangements and provision of locum.

22. Retirement of partner from the partnership: (a) After expiration of what period. (b) Period of notice of intention to retire. (c) Option for remaining partners or partner to purchase share of retiring partner—(i) price or method of determining same including basis of valuing of goodwill; (ii) method and terms of payment of price and of interest if payable; (iii) whether book debts are to be included in assets or collected and divided by remaining partners or partner. (d) Right of retiring partner to sell his share to another practitioner if option is not exercised by remaining partners or partner and provision for partnership between remaining partner or partners and purchaser. (e) Provision for introduction by retiring partner of his patients etc. to remaining partner or partners or incoming partner. (f) Restriction on practice of retiring partner.

23. Any other provision for termination of partnership, e.g., on notice after a specified period with right of all partners to set up and carry on practice without restriction.

24. Death of a partner during partnership: (a) whether surviving partners or partner must purchase share of deceased partner and if so (i) price or method of determining same including basis of valuing goodwill; (ii) method and terms of payment of price and interest if payable; (iii) whether book debts are to be included in assets or collected by survivors or survivor and divided. (b) Whether surviving partners or partner is not to be required to purchase share of deceased but to have an option to purchase and if so at what price and on what terms and what is to happen if option not exercised. Is the whole practice and the assets thereof to be sold and the partnership dissolved and what restrictions on practice are to be provided for in relation to all partners in that event.

25. Provision for each one or more partners to take out a policy of life assurance on the life of each other partner to provide money to enable or assist surviving partners or partner to purchase share of deceased partner.

26. Sickness of partner: (i) For short periods. Provision of locum and at whose expense and provision for sharing of profits in that event. Whether a period of sick leave is to be allowed without any loss to the sick partner of profits, i.e. remaining partners to carry on alone. Whether a sickness and accident insurance is to be taken out to provide for this happening. (ii) For long continuous period whether in this event the other partners or partner may determine the partnership and if so on what terms, e.g., same terms as apply in case of the death of a partner. What period of absence from the practice is to elapse before provision can be invoked. Right to have any dispute determined by arbitration. Restrictions on practice of absent partner if his share is purchased by the others or other.

27. Misconduct of a partner. Right of other partners or partner to determine partnership as to offending partner and expel him on specified notice. What consequences are to flow from this, e.g., same provisions as if offending partner had died with say a reduced value being placed on goodwill with right to pay price over a period. Right to have any dispute determined by arbitration. Restrictions on practice of offending partner if his share is purchased by the others or other.

28. Provisions for working of practice: (a) Consulting hours, arrangements for. (b) Control of staff, engagement and dismissal of same. (c) General policy. Who, if any, is to have right of determining this in event of disagreement? (d) Purchase of equipment etc.

29. Provisions for valuation of assets.

30. Provisions to apply if any partner called up for military service.

31. Provision for giving of notices.

32. Provision for settlement of differences by an agreed person otherwise by three persons to be appointed for the purpose by Council of British Medical Association (New South Wales Branch).

33. Provision for purchase or lease of premises where practice is carried on belonging to a deceased or retiring partner by surviving partner or partners or remaining partner or partners.

34. Other usual provisions contained in ordinary partnership agreements providing for partners to be just and faithful to each other, pay separate debts, not to suffer assets to be charged, not to assign or charge share etc.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

AN ANNUAL MEDICAL CONGRESS.[1]

[From the *Australasian Medical Gazette*, October, 1882.]

THE successful establishment of branches of the British Medical Association in the Australian Colonies, and the completion of the first volume of a journal devoted to the advocacy of the interests of the medical profession, as federated in this Association necessarily brought an inference that the period is approaching when the profession, thus represented, will meet in congress after the manner of the annual gatherings of the parent Society in the old country. Nothing, as is well known both here and in Great Britain, has done more to cement together the great brotherhood of medicine, speaking the English tongue, than these yearly conferences. There was a time when the profession in one city in England knew little or nothing of what was doing in the next. The metropolitan journals almost contemptuously ignored the doings and sayings of the profession in the country, and one principal object of the founder of the British Medical Association—which at first was known as the Provincial Medical Association—was to bring into notice those who, being only provincial, had no metropolitan recognition. Both the London Medical Societies and the London Medical Journals were exclusive, and whatever they did in acknowledgement of the labours of extra-urban workers was less cordial than condescending. But the association and its representative organ have totally changed all that, and the better understanding now existing has been due in considerable measure to the personal knowledge gained of each other by medical men when they met others face to face at the annual meetings. And it is exactly this kind of solidarity which it is so desirable to bring about in Australia. For with few individual exceptions, the medical men of one colony have no acquaintance with those in another. Their education has been substantially the same: their modes of practice are identical: their interests are similar: their rights are in no material respect different: and yet they are subject to different social conditions; and they are affected differently by the legislation of the several states. There is not a complete Medical Act in any of the colonies: there is no common understanding of the value of medical services: no principle is acknowledged in the bestowal of public offices: and the ignorant pretender pursues his calling in as much security as the regularly educated practitioner. Appeals have been made from time to time to Government for redress, but the appeals have had little weight because they were local, not general. But opinions coming as the collective opinion, or protest, of a conference composed of representatives from all the provinces of Australia, could not well fail to influence the several legislatures and governments to which they might be submitted.

Obituary.

THOMAS GLASS MILLAR.

WE are indebted to Dr. Clifford Scantlebury for the following account of the career of the late Dr. Thomas Glass Millar.

The profession has sustained a very severe loss by the death of Thomas Glass Millar. Perhaps his ear and throat colleagues feel this so keenly because he was a constant contributor to all efforts for advancement of the specialty by writing, speaking, demonstration of cases and teaching.

Millar was born in Queensland in 1900. His school education was gained at Clayfield College and Brisbane Grammar School before he entered Ormond College, University of Melbourne, in 1918. Qualifying in 1923, he won a place as resident medical officer (1923-1924) and as registrar (1924-1925) at the Royal Melbourne Hospital. In 1925 he was

[1] From the original in the Mitchell Library, Sydney.

resident medical officer at the Victorian Eye and Ear Hospital. Three years were then spent in general practice with Dr. Heffernan at Fairfield, during which time he was a clinical assistant at the Victorian Eye and Ear Hospital.

Much of 1928 and 1929 was spent abroad in London, Edinburgh and Vienna, where Millar did extensive courses as well as obtaining the D.L.O. (London) and F.R.C.S. (Edinburgh). Returning to Melbourne in 1929, he practised his specialty in Collins Street, and did a phenomenal amount of public hospital work. So widespread were his appointments that one feels that a list of these is warranted: (i) second assistant, Royal Melbourne Hospital, ear and throat department, 1928 to 1935; (ii) first assistant to the same, 1935 to 1948; (iii) ear, nose and throat consultant, Fairfield Hospital, 1929 to 1931; (iv) honorary first assistant to Victorian Eye and Ear Hospital, 1932-1938; (v) assistant, ear, nose and throat department, Royal Children's Hospital, 1932 and 1933. Millar was also honoured by being made consultant to the Royal Australian Air Force from 1940 to 1958 with the rank of squadron leader and later wing commander. At all these hospitals and in his private practice his colleagues noticed the very high standard of his work. His extensive book knowledge, his clarity of thought and his operative dexterity were all appreciated at different times.

His published articles include the following (all appeared in THE MEDICAL JOURNAL OF AUSTRALIA): "Two Acute Ear Conditions", August 30, 1930; "Observations on Treatment of Hay Fever by Endonasal Radiation with Ultra-Violet Light", October 3, 1931; "Results of Treatment of Antral Infections", October 10, 1936; "Endonasal Antrostomy: An X-Ray Study", October 22, 1938; "Suppuration in the Apex of the Petrous Part of the Temporal Bone Successfully Drained by Operation", May 22, 1937; "Nasal Septoplasty", July 24, 1954. In addition, "Recovery from Otogenous Meningitis" (with G. A. Penington) appeared in the *Royal Melbourne Hospital Clinical Reports* in June, 1938. No mention of it occurs in this list, but the writer clearly remembers a meeting of the Royal Australasian College of Surgeons where Millar showed patients and described his surgery of external auditory canal exostoses. This was first class, and occurred before the general practice of endaural surgery.

Apart from his medical work, Millar had many accomplishments. He was interested in music as a pianist and a performer in the Ormond College orchestra and the University of Melbourne orchestra. Gardening was his special hobby in later years. His sporting performances varied with his age. He represented Ormond College at cricket (captain, 1922), rowing, football and tennis. He also played in the University second eleven. Later he became a keen golfer and a prominent pennant bowler and president of his club.

In 1925 he married Miss Marie Rene Bryse. His elder daughter, Marilyn, now Mrs. Rich, gained the degree of bachelor of commerce at the University of Melbourne. A younger daughter, Susan, is a trainee nurse at the Royal Melbourne Hospital. His son, Hugh, qualified in medicine, and has been a resident medical officer at the Royal Melbourne Hospital and later a demonstrator in anatomy at the University of Melbourne. It is good to know that he is following in his father's footsteps. At present he is resident medical officer at the Victorian Eye and Ear Hospital.

To all the members of Thomas Glass Millar's family and to his vast circle of friends we offer our sincere sympathy in their great loss.

Dr. GEOFFREY PENINGTON writes: It has been recognized for many years that it is of vital importance in the training of a specialist that a thorough grounding in medicine and surgery, and a clear conception of the problems of patients as individuals, should be attained before embarking on the particular discipline. Thomas Glass Millar had decided to adopt this course in achieving his ambition to excel as a specialist surgeon in diseases of the ear, nose and throat, and set out methodically to do so after graduation at the University of Melbourne in 1923. As a resident medical officer at the then Melbourne Hospital, he worked hard to gain experience in general medicine and surgery, and although he followed this by further training at the Victorian Eye and Ear Hospital, he made a virtue of necessity in entering general practice in Fairfield.

Relinquishing general practice to obtain advanced training overseas and acquire senior surgical qualifications, Tom Millar never forgot the lessons learnt in general practice. His patients were to reap the benefit of this throughout his career.

On return from overseas, he commenced practice in Collins Street and obtained a position in the ear, nose and throat department at the Melbourne Hospital, where for many years he gave excellent service and was a member of Mr. G. C. Scantlebury's team.

Throughout his professional work, outstanding characteristics were his critical appraisal of clinical problems, his realization of technical limitations and dangers, his determination to advance the standard of work in his specialty, and his ability to assess the patient as a whole rather than as a problem limited to the ear, the nose or the throat. A keen observer, ruthless in his self-criticism, critical of any procedure which could be inimical to the general well-being of the patient concerned, possessed of the soundest judgement, it is understandable that his own work was of the highest quality, and made him a leader in his field. He made many valuable contributions to his specialty by his work, his writings and his painstaking teaching of students.

During the second World War he served with the Royal Australian Air Force with the rank of squadron leader, and continued to give service for a considerable time after the war.

Outside his professional work, Tom Millar had many interests. An accomplished pianist, he delighted in leading a group about the piano with popular items, but retained a great interest in more serious musical matters. He played sport for the enjoyment of the games and the people with whom he played. He was a very keen and able player of ball games, and a generous opponent. At the billiard table, on the golf course and on the bowling green, he was a student of the games and ever ready to assist, encourage and instruct those less adept; and his efforts availed much. His enjoyment of sport was a source of recuperation for his work, although often the intensity of efforts precluded the desired relaxation; but his temperament was such that mediocrity could not satisfy and he had to give of his best.

Gardening was a hobby which resulted in his home, of which he was justifiably very fond, being surrounded by a pleasing, colourful and select garden; but he was equally proud of the productivity of his kitchen garden. It was in keeping with the home-lover that he was never happier than when his friends, and those of his family, were enjoying themselves in his home.

Photography occupied less time in latter than in earlier years, but his proficiency in this was a source of enjoyment for others as much as for himhelf.

A loyal friend of many friends, both within and outside the profession, he was, none the less, sometimes misunderstood. Those who knew him best realized his sterling work, knew that his candour was due to his earnest desire to be honest with himself and others with the object of improving things for the "common weal", understood his sensitiveness, and appreciated his devotion to the often self-appointed necessary tasks which he recognized would not otherwise be attempted.

It is almost presumptuous to speak of his happy family life, but it was a privilege to have glimpses of it and to share in some of his joys. He never lost sight of his responsibilities to those dependent on him.

Tom Millar is sadly missed by a very large circle of friends, associates and patients. To be taken suddenly whilst in apparently good health was merciful to him, who would have found limitation of activity intolerably irksome; but we unite in extending our deep sympathy to his wife, whom he adored, and to his son and daughters whom he loved so dearly.

DR. ALFRED OLDHAM writes: The sudden death of Tom Millar came as a blow to his friends, as he had always appeared so virile and well. I first met Tom in 1918, when he, from Brisbane Grammar School, and I, from Launceston Grammar, began a lifelong friendship as room mates. Tom Millar was an exceptionally good student, obtaining honours in many subjects. He was also a fine all-round sportsman and represented Ormond in cricket, rowing, tennis and football—although brought up on rugby. Ormond men of Tom's vintage will remember the happy hours of song and mirth that Tom's gift as a pianist provided.

After graduation, Tom became a resident at the Royal Melbourne Hospital and later for a short time at Fairfield Infectious Diseases Hospital. After a short time in general practice at Fairfield, he left for England and obtained his F.R.C.S. (Edinburgh) and returned to Melbourne to specialize in ear, nose and throat. He was immediately successful, and built a large and prosperous practice. He served for many years on the honorary staff of the Royal Melbourne Hospital. It was my great privilege to act as best man at his wedding to Miss Marie Bryse. Tom Millar, with his slow speech and his kindly smile, helped many people.

I shall leave it to others to speak of his great professional ability and his intense interest in his chosen specialty. May it be my right to pay a tribute to a fine, lovable man, a devoted husband and a proud father. The death of Tom Millar has left a gap in the hearts of many people, and to Marie and his family the heartfelt sympathy of the profession is extended.

DR. FRANK MAY writes: Thomas Glass Millar I have known from early university days, when I first met him holidaying at Erskine House, Lorne. As his school days were spent in Queensland, he did not have a large number of young friends here in Victoria. He was a fine-looking young man with a pleasant manner, and he was a good mixer who soon made friends; but he was never enthusiastic about the more rowdy elements of university life.

He, at that time, showed us his skill at tennis, a game at which he later represented Ormond College. He was a natural sport and could play most games well, representing Ormond also at cricket, rowing and football. At other sports he also showed considerable skill. All at the Athenæum Club knew of his love for snooker, and in later life at bowls he was an enthusiast, and was a great personality at his club, Glenferrie Hill, where he was at one time president. He was noted for his strong opinions about the game. Finally, at golf, his all-round skill made him a difficult man to beat. It seemed designed that his end should come the way it did, on the golf course.

His many friends appreciated his natural gift of music. At the piano he was superb. Tom would always get an audience of lusty voices, and many a happy time we had in later years at his home in Hamilton Road. All the old songs would be greeted with great enthusiasm. He always had his music and would always play the piano at any gathering of friends.

We all loved Tom for his forthright manner, his friendly approach and wonderful hospitality, so admirably aided by his charming wife. He was a great home lover, and nothing suited him more than to be in the bosom of his family. He was a good, solid student, who gained honours and finished tenth in his year. Going into general practice gave him an understanding of the problems of his specialty which helped in his success. Always a good diagnostician, he was, as well, a skilful operator. In work, in sport and in his home and garden, he was always an enthusiast and most efficient. We extend our deepest sympathy to his widow, his son, Dr. Hugh Millar, his two daughters, Mrs. Ken Rich and Sue, and his aged mother, who had the task of his upbringing alone for so many years.

GEORGE WILLIAM CARDEW MACARTNEY.

WE are indebted to Sir Kenneth Fraser for the following account of the career of the late Dr. George William Cardew Macartney.

George William Cardew Macartney, the only son of Dr. George Macartney of Northern Ireland, was born in Brisbane on January 2, 1887. His parents both died in his early infancy, and he was brought up in New South Wales by his uncle and aunt, Mr. and Mrs. Alfred Thompson. He went as a boarder to The Armidale School in 1902, where he quickly showed his ability. In his last year at school he was head house prefect, captain of the football fifteen, captain of sports, a lieutenant in the cadet corps and school librarian. His crowning achievement at school was to win the Rawson Cup in 1905 for the best all-round boy in the school.

Entering St. Paul's College, the University of Sydney, to study medicine, he graduated in 1910. He toured New Zealand with the University fifteen in 1909, gaining a place in what was then a very powerful side.

After a period as resident medical officer at Sydney Hospital, he joined Sir Earle Page in practice at Grafton. On the outbreak of the first World War, he enlisted immediately and sailed as regimental medical officer with the 2nd Light Horse Regiment in the first convoy to leave Australia. He saw extensive service on Gallipoli (where he was wounded) and also in France, where he rose to command the Tenth Field Ambulance, was awarded the Distinguished Service Order, and was twice mentioned in dispatches.

Shortly after returning to Australia he married Miss Lucie Macgregor, of "Dunstaffnage", Glen Innes, and in 1921 moved to Brisbane, where, except for the period of the second World War, he continued to practise on Wickham Terrace until his death. In 1924 he was appointed to the honorary surgical staff of the Mater Hospital in Brisbane, and he became a Fellow of the Royal Australasian College of Surgeons in 1932.

I first met him shortly after he came to Brisbane, and got to know him well and appreciate his true worth when I was a young, inexperienced medical officer in the Militia. I can recall many occasions in those years between the wars when his wisdom, understanding and sound common sense showed us the qualities of leadership inherent in him. I shall never forget his support and guidance in the early days of the second World War, when he had unhesitatingly given up his private practice to accept the important task which devolved upon him as Deputy Director of Medical Services in Queensland. As soon as he had successfully built up the army medical service in the Command, he did not rest content until he was given an opportunity to serve once again overseas, this time as commanding officer of the 2nd/12th Australian General Hospital in Colombo.

As a commanding Officer, "Dad" Macartney had, in full measure, that indefinable quality which inspired confidence and affection in those serving under him. As a result, the 2nd/12th A.G.H., which he commanded for more than three years, was one of the happiest and most efficient army medical units I have ever seen. The full record of his army career is given elsewhere.

In his professional life he proved himself a sound, careful and understanding practitioner.

Practical to a degree, he had the capacity to get to the core of any problem very quickly. Modest and self-effacing, he quite unconsciously had the capacity to gather friends around him in a way given to few men. Although very tolerant and ever ready to defend the underdog, he was quick to condemn anything that savoured of humbug or hypocrisy. Perhaps his greatest qualities were his understanding, his tolerance, his robust sense of humour and his capacity to see the best in people.

In his later years nothing gave him greater pleasure than the tennis which he played with his contemporaries at the

Queensland Club. Armed with an old, loosely strung racket, he was a formidable opponent; his serve was hit very flat with a lot of undercut; it came off the grass quite sharply, generally on the backhand, and he seldom lost a service game. He played regularly and with undiminished enthusiasm until less than six months before his death, and kept his keen eye to the end.

Early in 1958 he underwent a major operation, and after making a good recovery he suffered a coronary occlusion a few months later and died quietly on August 14.

Those of us who had the privilege of enjoying his friendship are the poorer for his passing, and we extend our deepest sympathy to his wife and daughter.

DR. CHARLES MARKS writes: Friendship and respect for "Dad" Macartney have played a big part in my life. He was a close friend and colleague of my father's; they sailed together in September, 1914, on the same troopship, and the friendship continued till my father's death.

As I grew up, I was pleased to consider him as one of my own friends, and later to become one of his colleagues in civilian practice and in the Australian Army Medical Corps. He was Deputy Director of Medical Services (Army) when I was first commissioned, and for two years before his illness he was President of Army Medical Boards, responsible to me as Deputy Director of Medical Services. He was never personally ambitious, but as his record shows, he never shirked responsibility when it came his way. As a commanding officer and administrator, he was firm without harshness, always scrupulously fair and just. As a doctor he was up to date in his knowledge, shrewd in his judgement and, above all, human in his understanding.

I find it impossible to portray in words my opinion of a man whose personality, for almost forty years, was an important part of the background of my life; but I feel that he was a man, and one could truly say he was a gentleman and one who served his country well.

The following is a summarized record of his army service in both World Wars.

He was first appointed to commissioned rank (Honorary Captain) in the Reserve of Officers of the Australian Army Medical Corps on April 7, 1913, and appointed Captain (Provisional) on February 9, 1914, in the then Citizen Military Forces.

His service in the Australian Imperial Force commenced on August 20, 1914. He embarked on the troopship *Star of England* as Captain (Medical Officer), 2nd Light Horse Regiment, sailing from Albany in convoy on November 1, 1914. Whilst overseas, he was promoted to the rank of major on February 25, 1916, and to that of lieutenant-colonel on May 2, 1918. It was during this service that he commanded the 10th Field Ambulance, was twice mentioned as "deserving of special mention", and was awarded the Distinguished Service Order on January 1, 1919.

Several times he is mentioned in the "Official History of the Australian Army Medical Services, 1914-18". In one place, where the historian is describing the medical arrangements for the clearance of casualties on the Western Front, he has written the following:

> Thus the personal diary of one of the most experienced and forthright A.A.M.C. Officers, who had served in front line units throughout the war [Lieut.-Col. G. W. Macartney, commanding 10th Field Ambulance] has for September 29th the laconic entry:
>
> "Americans [*i.e.*, 27th Division] jumped off 1,000 yards behind line [of the barrage)] cut to blazes: our division [3rd] came in for a lot of machine-gun fire. Things generally mixed. Evacuation awful."

Macartney maintained his interest in the army once again by accepting the command of the 7th Field Ambulance (Citizen Military Forces) on September 1, 1921, the appointment of Acting Assistant Director of Medical Services, 11th Mixed Brigade, on November 1, 1922, and Assistant Director of Medical Services, Fifth Division, on February 1, 1927. Thence he passed to the Unallotted List on February 1, 1931, and to the Reserve of Officers on February 1, 1936. He was appointed Deputy Director of Medical Services, First Military District, and promoted to the rank of temporary colonel on March 7, 1938.

On the outbreak of hostilities in September, 1939, he accepted the full-time responsibility of his army appointment as Deputy Director of Medical Services. He carried on through very arduous years until he was given the command of the 2/12 Australian General Hospital on June 20, 1941, and promoted Substantive Colonel; he saw service overseas with the unit in Colombo.

Relinquishment of this, his last command, took place on September 7, 1944, when he was placed on the R.S.L. Retirement List.

DR. J. C. HEMSLEY writes: It was a great privilege to know George Macartney as a friend and colleague for over thirty years, and a very great honour to be chosen by him as Officer Commanding the Surgical Division of the 2nd/12th Australian General Hospital, which he commanded in the second World War. He was a sound administrator and firm disciplinarian, administering justice to patients and members of the unit without prejudice or favour, so that every man had his due. Off duty he was a jolly mate and fraternized just as freely with "other ranks" and junior members of his unit as with visiting "V.I.P.'s". He was respected and esteemed by all who knew him, and will be sadly missed by all his old comrades.

Correspondence.

MANGANESE AND MONGOLISM.

SIR: Many will applaud Dr. J. Orde Poynton's (M. J. AUSTRALIA, November 15, 1958) timely emphasis upon the importance of the study of the natural history of disease, and his reminder of the many advances in medicine that have sprung therefrom. It is in the hope that such an approach towards the riddle of mongolism may be stimulated that I offer the following observations.

Manganese has been shown to be an essential trace element in certain animal species.[1] It is necessary in rabbits, chicks, rats and mice for proper bone development, growth and normal reproduction. In manganese-deficient female rats there is defective ovulation, and in the male rat and rabbit sterility and absence of libido associated with marked testicular degeneration and lack of spermatogenesis.

The naturally occurring disorders of poultry known as perosis or slipped tendon and nutritional chondrodystrophy are due to low intakes of manganese from certain diets, and prevented by manganese supplementation.

Chondrodystrophy in chick embryos results from manganese deficiency in the diet of the hen. It is characterized by greatly shortened, thickened legs and thickened wings, shortening of lower mandible, globular head, protruding abdomen and retarded down and body growth.

It is always a dangerous exercise of the imagination to draw parallels between animal and human structure, func-

[1] Underwood, E. J. (1956), "Trace Elements in Human and Animal Nutrition", Academic Press.

tion or behaviour, but although possibly fallacious, it is not difficult to detect similarities between this condition of chick embryos and mongolism in man.

Now the manganese content of dairy products, animal tissues, fish and sea foods is extremely low (0·2 to 0·5 part per million), whereas tea is exceptionally rich in manganese (150 to 900 parts per million), about one-third of which is soluble in hot water and therefore consumed. No other ordinary item of diet approaches tea in manganese content.

Levels of calcium and phosphorus, especially the latter, affect manganese absorption. Diets containing excess phosphorus in relation to calcium impose a higher manganese requirement on the animal. Perosis in poultry is aggravated by high intakes of calcium and phosphorus.

It is precisely this sort of dietary imbalance that is so common amongst pregnant women. My obstetrician colleagues inform me that many pregnant women give up tea altogether, and, of course, young expectant mothers are usually exhorted to eat plenty of eggs, butter and milk, animal or fish protein, green vegetables and fresh fruit—all with an extremely low manganese content, but *in toto* with high calcium and phosphorus.

Thus, assuming that mongolism was due to manganese deficiency in early pregnancy, the dietetic stage is appropriately set. Of course, an obvious objection is that the presumed adverse dietetic situation occurs far more commonly than does mongolism. But there are so many possible variables in ingestion, absorption, storage, utilization and excretion of manganese that would explain the difference between the numerical frequency of mongolism and the presumed cause.

It is well known that mongolism is as common amongst the offspring of mothers in the highest socio-economic groups as amongst those in the lowest. This sort of dietetic situation would explain such an incidence.

To prove such an hypothesis would require quite elaborate planning. It could be done possibly by painstaking microchemical assay of the manganese content of the tissues of mongol babies in comparison with normal; by careful investigation of dietetic habits of mothers of mongols, which would suffer from the great disadvantage of being retrospective, and could, in view of what I have said concerning variables, be quite inconclusive, even though there was a real relationship to manganese deficiency in the diet. Finally, it would be possible to run the prospective experiment, provided sufficient obstetricians and general practitioners would collaborate, of urging all pregnant women to continue or commence to drink tea generously, especially in the first trimester, and compare the subsequent incidence of mongolism amongst the children of this group of mothers as compared with that amongst women consuming little or no tea.

On the other hand, it would be much easier and quicker to refute the proposition. If, for example, experienced practitioners were able to say that, to their certain knowledge, mothers of mongol babies continued to drink considerable quantities of tea during that pregnancy, it would hardly be worth while pursuing the suggestion further.

Yours, etc.,

Receiving House,
Royal Park,
Victoria.
Undated.

J. F. J. CADE.

A CLINICAL APPRAISAL OF "SPARINE", "STEMETIL", "TRILAFON" AND "MARSILID".

SIR: I would like to make some comments on the article by Dr. Morgan and Dr. van Leent (M. J. AUSTRALIA, November 22, 1958), particularly in regard to perphenazine ("Trilafon").

The authors state that no attempt has been made to carry out double-blind trials, giving two references in support of their decision. Both these stress that a brand-new therapy or medication must first be proved active. With regard to "Trilafon", there are at least twelve references easily obtainable, dating from November, 1956, and in the main these state that the drug is effective. Thus "Trilafon" is hardly brand new. Whilst there are many criticisms of the use of placebos, and some doubt about all double-blind trials, the fact is that surprising improvement occurs at times in some patients who are on placebo.

Further, in a "pilot" trial carried out in March, 1958, at Parramatta, N.S.W., nine patients on "Trilafon" and nine on placebo were roughly matched—all showed disturbed behaviour (such as agitation, restlessness and excitement), and belonged to the diagnostic groups of schizophrenia, manic-depressive psychosis and involutional melancholia. Three patients in the placebo group recovered and one improved. The three who recovered went on leave and were still on leave three months later. Nevertheless, the results in the "Trilafon" group were very good, seven patients improving markedly, and this very small trial suggested that "Trilafon" was effective in the management of cases of the type described.

Surely, then, it would be worth while knowing how many of the Kenmore patients would have recovered without the drug.

Regarding Table I, 19 patients are shown as "employed in hospital" or "idle" under the heading "recovered", yet in the text it is stated that all recovered patients have left hospital.

Finally, may I draw attention to the occasional patient receiving "Trilafon" who shows alarming and severe side effects. These effects were described by Berry, Kamin and Kline[1] in children. One of our patients on 24 milligrammes of "Trilafon" per day showed cataleptic signs (arms held out, "waxy flexibility", eyes turned up, violent spasms in the legs). A patient on 48 milligrammes a day developed severe muscular spasms culminating in opisthotonus with some cyanosis. In addition, we have seen trismus, along with much anxiety. In all cases, cessation of therapy *plus* anti-Parkinsonian treatment has led to rapid recovery.

Yours, etc.,

Mental Hospital,
Mont Park,
Victoria.
December 1, 1958.

D. M. SOMERVILLE.

SOME LESSONS OF MEDICINE.

SIR: We read from time to time many learned and erudite presidential addresses, but it is seldom we are reminded of the basic facets of character with such a delicate depth of feeling as shown by Dr. S. A. McDonnell, of Queensland (M. J. AUSTRALIA, November 29, 1958, page 717).

The writer holds that the practice of medicine should teach humility, belief in a Supreme Being and sympathetic understanding of the foibles of mankind, though whether these characteristics are *post hoc* or *propter hoc* is perhaps open to question.

May it not be that happily a few have these traits born within themselves, and therein lies the difference between the doctor and the practitioner?

Yours, etc.,

440 King William Street,
Adelaide,
Undated.

J. F. DREW.

ADVERTISING MATTER AND THE MAILS.

SIR: Are we to have no secrets at all? I am referring to the increasing percentage of advertising material reaching us through Her Majesty's mails, in the post-card form or with most of the message on the envelopes.

Yesterday, for example, I received a large card assuring freedom from nausea of pregnancy. This was sent by a firm which over the years has been considered among the most conservative of medical houses. Persons handling postal material are not blind, and these advertisements must be read by thousands of receiving, sorting and delivering officers of the Post-Master General. When, as in this case, the dosage is included on the card, surely some will be tempted to buy the advertised substances, for the use of their family, or self, with possible incorrect or over-dosage.

Whilst on this subject, I am reminded of the time several years ago when one of my children ate a packet of six five-milligramme tablets of amphetamine sulphate, which he found amongst the morning mail. He recovered with emetics and sedatives. Children in the streets could easily remove

[1] *U.S. Armed Forces M. J.*, 1958, 9: 745.

doctors' mail from the letter-boxes, with dire results should they ingest some of the substances which are received at intervals in unregistered, easy-to-open packages.

Who would be responsible in such a case? The sender, the postal authorities or the doctor?

Yours, etc.,

J. T. ST. LEGER MOSS.

Homer Street,
Earlwood,
N.S.W.
December 6, 1958.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act*, 1938-1958:

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*a*) of the Act: Fletcher, Garth Trevor, M.B., B.S., 1957 (Univ. Queensland); Rothberg, Brian Harry, M.B., B.S., 1956 (Univ. Melbourne); Tucker, Arthur Douglas, M.B., B.E., 1956 (Univ. Queensland); Watson, George Michael, M.B., B.S., 1936 (Univ. Adelaide).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1*b*) of the Act: Colville, Wesley Creighton, M.B., Ch.B., 1938 (Univ. Glasgow); Cook, George Edward, M.B., B.Ch., 1943 (Univ. Witwatersrand), D.P.M. (R.C.P. & S.), 1958; Dorfman, Bertrand Solomon, M.B., Ch.B., 1950 (Univ. Edinburgh); Flynn, Cyril Thomas, M.B., Ch.B., 1957 (Univ. Birmingham); Hicks, Robert Carey, M.B., B.S., 1957 (Univ. London), M.R.C.S. (England), L.R.C.P. (London), 1957; Hobson, Albert Charles MacArthur, M.B., B.Ch., 1941 (Univ. Dublin); Lennon, Seamus, M.B., B.Ch., 1948 (N.U. Ireland), D.P.M., R.C.P. & S. (Ireland), 1953; Robertson, Andrew Rollo, M.B., B.S., 1956 (Univ. London), M.R.C.S. (England), L.R.C.P. (London), 1956; Singleton, Alfred Cahoon Bruce, M.B., Ch.B., 1939 (Univ. Aberdeen), D.T.M. & H. (Edinburgh), 1948, D.P.H. (R.C.P. & S.), 1952; Witherspoon, Edward William, M.B., Ch.B., 1949 (Univ. Birmingham).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2A) of the Act: Aroney, James Theodore, M.D., 1940 (Univ. Athens), M.R.C.S. (England), L.R.C.P. (London), 1958, L.M.S.S.A. (London), 1958.

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2B) of the Act: Becker, Andreas Aloysius, M.D., 1940 (Univ. Szeged).

Registered medical practitioners who have been issued with licences under Section 21C of the Act: Harasymczuk, Isjaslaw Leonid Plato, M.D., 1950 (Univ. Innsbruk); Natasien, Vladimir, M.D., 1924 (Univ. Charkov); Szechowycz, Bohdan, M.D., 1950 (Univ. Erlangen).

QUEENSLAND.

THE following has been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*c*) of *The Medical Acts*, 1939 to 1955, of Queensland: Previtera, Sebastiano, M.B., B.S., 1957 (Univ. Queensland).

The following have been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*d*) of *The Medical Acts*, 1939 to 1955, of Queensland: Johnson, Frank Louis, M.B., B.S., 1955 (Univ. Sydney); Gruchy, Michael Victor, M.R.C.S., England, L.R.C.P., London, 1953, M.B., B.S., 1953 (Univ. London); Hall, Christine, M.B., Ch.B., 1953 (Univ. Glasgow); Lynn, Robert, M.B., B.S., 1951 (Univ. Melbourne); Hillier, Doreen Elisabeth Dawson, M.B., Ch.B., 1951 (Univ. Bristol), D.Obst., R.C.O.G., London, 1956; Ireland, Graham Malcolm, M.B., B.S., 1952 (Univ. Adelaide).

The following additional qualifications have been registered: Mead, Kevin William, F.F.R., 1957; Shearer, Alexander Boardman, M.R.C.P., London, 1958; Knapp, Bernard Joseph, M.R.A.C.P., 1958; Liddle, William Warwick John, F.R.C.S., Edinburgh, 1958; Nicolaides, Nicholas John, M.C.P.A., 1958; Kynaston, Bruce, D.C.R.A., 1958; Johnson, Frank Louis, M.R.A.C.P., 1958.

The College of Radiologists of Australasia.

DIPLOMA EXAMINATIONS.

THE College of Radiologists of Australasia will be holding examinations for the diploma of the College commencing on Monday, March 2, 1959, for Part I and Part II. Part I is held in the candidate's own State, and the Part II examination will be held in Melbourne. Full details and application forms are available from the office of the College, 12th floor, 135 Macquarie Street, Sydney. Entry forms must be received at the College office in Sydney not later than January 5, 1959.

Royal Australasian College of Surgeons.

COUNTRY MEETING AT CANBERRA.

THE N.S.W. State Committee of the Royal Australasian College of Surgeons has organized a country meeting at Canberra on March 14 and 15, 1959. This will be attended by Mr. W. Gissane, Sims Commonwealth Travelling Professor. Details of the programme will be announced later.

As accommodation in Canberra is likely to be heavily booked, those intending to be present are advised to make accommodation arrangements early, and to inform the Honorary Secretary at 149 Macquarie Street, Sydney, of their arrangements.

All medical practitioners are invited to attend.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Advanced Surgery.

A FULL-TIME COURSE in advanced surgery suitable for candidates proceeding to the final F.R.A.C.S. examination will begin in Sydney on Monday, March 2, 1959, and will be held for a period of eight weeks, concluding prior to the final fellowship examination on May 1.

The course, which has been sponsored by the New South Wales State Committee of the Royal Australasian College of Surgeons and the Department of Surgery, University of Sydney, in conjunction with the Post-Graduate Committee in Medicine, will be under the direction of the Professor of Surgery, Professor John Loewenthal. The headquarters for candidates will be the Sir Harold Dew Study Room. Lectures, demonstrations and clinical teaching will be conducted at the Royal Prince Alfred Hospital, Sydney Hospital, St. Vincent's Hospital and the Royal North Shore Hospital.

The numbers at the course will be limited, and early application is essential. Preference will be given to candidates who have passed the primary examination of one of the Royal Colleges and have been approved by the Censor of the Royal Australasian College of Surgeons.

The fee for attendance is 25 guineas. Applications will close on February 16, 1959, and should be addressed to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

Notes and News.

Lady Margaret Hall, Oxford: Visiting Fellowships in Science.

Lady Margaret Hall offers during the three years 1958 to 1961 two visiting fellowships for women scientists.

The purpose of the fellowships is to attach to the College women graduates from the Commonwealth or the United States of America with experience in scientific research who want to spend sabbatical or other leave working in Oxford. The fellowships, each of which will be tenable for one year, will be awarded for successive (not concurrent) periods during 1958-1961, and may start in October or be deferred until January. The value of each is £500 (non-resident), with certain common room and dining rights during term.

In order to help those planning ahead for sabbatical leave, awards of one or both fellowships will be made early in June, 1958, or, if both are not filled, in the following June. Applications should reach the Principal not later than May 1, and should give age, academic record, financial situation (including applications made to other bodies), and a statement of the work proposed. The applicant should ask two persons of standing in her university, well acquainted with her work, to write independently to the Principal, and these letters also should be sent by May 1.

Arrangements to work in an Oxford laboratory are the responsibility of the applicant, and should be made before or at the time of application to the College; but the College should be notified at the time of application which laboratory has been approached.

Tonometer Testing Station.

A tonometer testing station has been recently established at the Glaucoma Research Unit of the Victorian Eye and Ear Hospital, Melbourne. Both the weighted and the weightless types of tonometer can be checked, and a small nominal charge (£1 Australian) is made for this service. It is expected that this service will be of interest to oculists in Australia, New Zealand and South-East Asia. Inquiries, and tonometers, should be addressed to Dr. Geoffrey Serpell, Medical Officer to Tonometer Testing Station, The Victorian Eye and Ear Hospital, Victoria Parade, Melbourne, Australia.

Australian Laennec Society: W.A. Branch.

At the annual general meeting of the Western Australian Branch of the Australian Laennec Society, held in October, 1958, the following office-bearers were elected: President, Dr. C. Fortune; Secretary-Treasurer, Dr. J. Smyth; Committee, Dr. G. Troup, Mr. J. A. Simpson, Dr. H. R. Elphick, Mr. F. J. Clark.

The Nuffield Foundation: Grants to Australia.

In the thirteenth report of the Nuffield Foundation for the year ended March 31, 1958, particulars are given of grants made by the foundation to a total of nearly eight and a half million pounds for research in various fields. Medical research in Australia has benefited in the following ways.

During the past three years, an investigation into the growth of children has been carried out under the direction of Professor S. Sunderland, head of the department of anatomy in the University of Melbourne. The Foundation has made a grant of £1200 per year for two years, in order that the project should not have to be abandoned for lack of funds.

At Sydney Hospital, Dr. Douglas Joseph, director of the department of anæsthetics and resuscitation, has been developing his department along the lines of those at Oxford. A fifteen-bed ward has been set aside for this purpose. The Foundation has made a grant of £1200 to Sydney Hospital, for the purchase of 10 proper resuscitation-type trolly beds for this ward, to minimize the need for moving patients and consequently the risk of post-operative shock.

With the help of a Foundation grant, fundamental research on the chemistry of inositols is being carried out at the School of Chemistry, University of New South Wales, under the direction of Associate Professor S. J. Angyal. The grant has been renewed for a further year at the rate of £800.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 29, 1958.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	..	2(2)	4(2)	..	..	..	..	..	6
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	2(1)	..	5	..	..	..	7	..	14
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	5(2)	14(13)	1(1)	..	..	1(1)	1	..	22
Diphtheria	1	1(1)	..	..	..	1	..	..	3
Dysentery (Bacillary)	..	..	3	7(6)	..	..	11	..	21
Encephalitis	2	..	..	1(1)	..	..	..	..	3
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	74(32)	27(15)	13(2)	15(11)	1(1)	..	3	1	134
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	2	..	2
Leptospirosis	..	..	1	..	..	..	..	1	2
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	3(1)	..	..	..	..	..	..	..	3
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	..	..	..	..	..	..	..
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	60(45)	..	11(7)	80(78)	..	1	..	152
Salmonella Infection	..	..	..	5(5)	3(3)	..	..	..	8
Scarlet Fever	11(5)	8(8)	5(2)	2(2)	3(2)	1(1)	..	..	30
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	2	..	11	..	13
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	22(14)	14(10)	18(7)	7(6)	14(4)	7(2)	1	..	83
Typhoid Fever	..	..	1(1)	..	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Professor C. W. Emmens, head of the department of veterinary physiology in the University of Sydney, and his collaborators, Dr. Ian White and Mr. A. W. Blackshaw, have for a number of years been engaged in fundamental and applied research on semen and artificial insemination. The object is to help solve the problem of infertility, both human and animal. The research now in progress in the department, with the help of a Foundation grant of £3360 over three years, is concerned with the chemistry of semen, the metabolism of spermatozoa and the factors affecting their survival. The results of the work may be of great importance for artificial insemination, for the diagnosis and treatment of male infertility, and for the chemical control of conception.

The Foundation has also been supporting research on the enzymes of endocrine glands under Professor V. M. Trikojus, head of the department of biochemistry in the University of Melbourne. A further grant of £600 has been made to enable Mrs. P. Todd, the research assistant, to continue her work for an additional six months.

Naval, Military and Air Force.

APPOINTMENTS.

THE following announcement is published in the *Commonwealth of Australia Gazette*, No. 74, of December 4, 1958.

Her Majesty the Queen has been graciously pleased, under date 13th November, 1958, to approve the appointments of the undermentioned officers in the capacity shown:

ROYAL AUSTRALIAN NAVY.

To be Honorary Physician to the Queen.

Surgeon Captain Kenneth Charles Armstrong, M.B., B.S., R.A.N.

Vice-Surgeon Captain James Martin Flattery, O.B.E., M.B., Ch.M., R.A.N.

Notice.

THE CHILDREN'S MEDICAL RESEARCH FOUNDATION OF N.S.W.

THE following is a list of donations to the Children's Medical Research Foundation of N.S.W. received from members of the medical profession in the period November 20 to December 3, 1958.

Professor Frank Fenner, £50.

Sir Hugh Poate, £21.

Dr. E. V. Barling, £10 10s.

Dr. J. F. Thomas, £5 5s.

Previously acknowledged: £7582 0s. 3d. Total received to date: £7668 15s. 3d.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Kovacic, Hinko Slavko, M.D., 1937 (Univ. Zagreb) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act*, 1938-1958), 11 Roberts Street, Strathfield, New South Wales.

Lambert, Godfrey Meyer, M.B., B.S., 1957 (Univ. Sydney), 11 Wiston Gardens, Double Bay, New South Wales.

Reading, Anthony John, M.B., B.S., 1957 (Univ. Sydney), 253 Oxford Street, Bondi Junction, New South Wales.

Koller, Karl Max, M.B., B.S., 1957 (Univ. Sydney), Callan Park Mental Hospital, Rozelle, New South Wales.

Seaborn, Rodney Frederick Marsden, M.R.C.S. (England), L.R.C.P. (London), 1946, 4 Hale Road, Mosman.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Knie, Wilhelm, M.D. (Univ. Vienna) (registered in accordance with the provisions of the *Medical (Registration) Act*, 1957), 5 View Street, Hawthorn, Victoria.

Deaths.

THE following deaths have been announced:

COEN.—Joseph Coen, on December 4, 1958, at Sydney.

STIMSON.—Francis Gordon Stimson, on December 7, 1958, at Harvey, Western Australia.

Diary for the Month.

JAN. 9.—Queensland Branch, B.M.A.: Council Meeting.
JAN. 19.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
JAN. 22.—Victorian Branch, B.M.A.: Executive of the Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales. The Maitland Hospital.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 10s. *per annum* within America and foreign countries, payable in advance.